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Machinery for Sawing Ship Stuff.

We present our readers this week with a perspective view of a mill, for sawing ship timbers, and other like stuff requiring to be sawed in curved and beveled lines. The machinery is the invention of J. Hamilton of this city.

We cannot explain the mechanism of this invention better than by conducting our readers to the hand saw-pit, and, after first pointing out the perfect ease with which the saw is there guided into any required curve, the absence of any undue straining of the saw blade, which is merely stretched in a frame of the lightest timber, the comparative indifference where the points of support may happen to be placed, to show that precisely the same operation is to be performed by the unfailing action of macinery. We shall thus draw the attention of our readers properly to the subject, because the whole operation must not be regarded as an evidence of the invincible power of machinery, such as our saw mills exhibit, but of the delicacy, and no less certainty and accuracy of operation for which machinery is equally celebrated.

Fig. 1 is a perspective view of the whole arrangement of machinery, fig. 2, exhibits the top plan of a log marked by the architect in the shape in which it is required to be sawed, and figure 3, exhibits the mode of hanging the saw.

a a is a saw frame or "gate," formed of hollow bars of wrought iron, combining great stiffness with the lightest possible construction, and guided upon the square bars, *b*, *b*, in the ordinary manner. The top and bottom rails of this frame are accurately turned, and serve as horizontal guides to the two internal frames, *c*, *c*, and *d*, *d*; these two internal frames are fitted to slide with great freedom, horizontally upon the top and bottom bars of the frame, *a*, *a*, *a*, *a*, but with motions perfectly independent of each other, and are made each to receive the buckles of a saw blade, with the power of altering their position to any ordinarily required distance. The saw blades, *e* and *f*, are suspended in their buckles upon centres, which admit of the saw blades being turned round upon their vertical axes at the will of the attendant. The whole outer frame, with the two inner frames, is put in rapid vertical motion by the usual arrangement of fly-wheels, cranks, and connecting rods, *g*, and is connected with the motive power by the fast and loose pulleys, *i* and *j*.—The weight of the frame is balanced as usual by an opposite weight on the arms of the fly-wheels. By this arrangement the attendant is able to guide each saw blade, independently of the other, along any required curved line that may have been marked upon the timber, *k k*. The oblique lateral motion necessary for this being given to each saw blade independently, by rotating the blade on its centres between the buckles, and by traversing the inner frames, *c c* and *d d*, across the bars of the outer frame. This motion is communicated to each saw blade by a forked lever of wood in the hands of the attendant, which he applies to the back of the saw, and thereby guides it along any required line. The transverse bar, *l*, *l*, is fixed across the mill frame, the slot in which serves to steady the lever, whilst the pins, *m*, *m*, serve as fulcra to aid the internal frames in their lateral motion. So far the arrangement for curvilinear cutting is complete. A piece of timber may thus be cut with its sides either straight or curved, either parallel or tapered, as it may have been designed or marked out; but in sawing of ship's timbers every possible curve demands at each point some specific bevel; and in order to meet this requirement a further apparatus is necessary.

HAMILTON'S MACHINERY FOR SAWING SHIP STUFF.

Fig. 1.

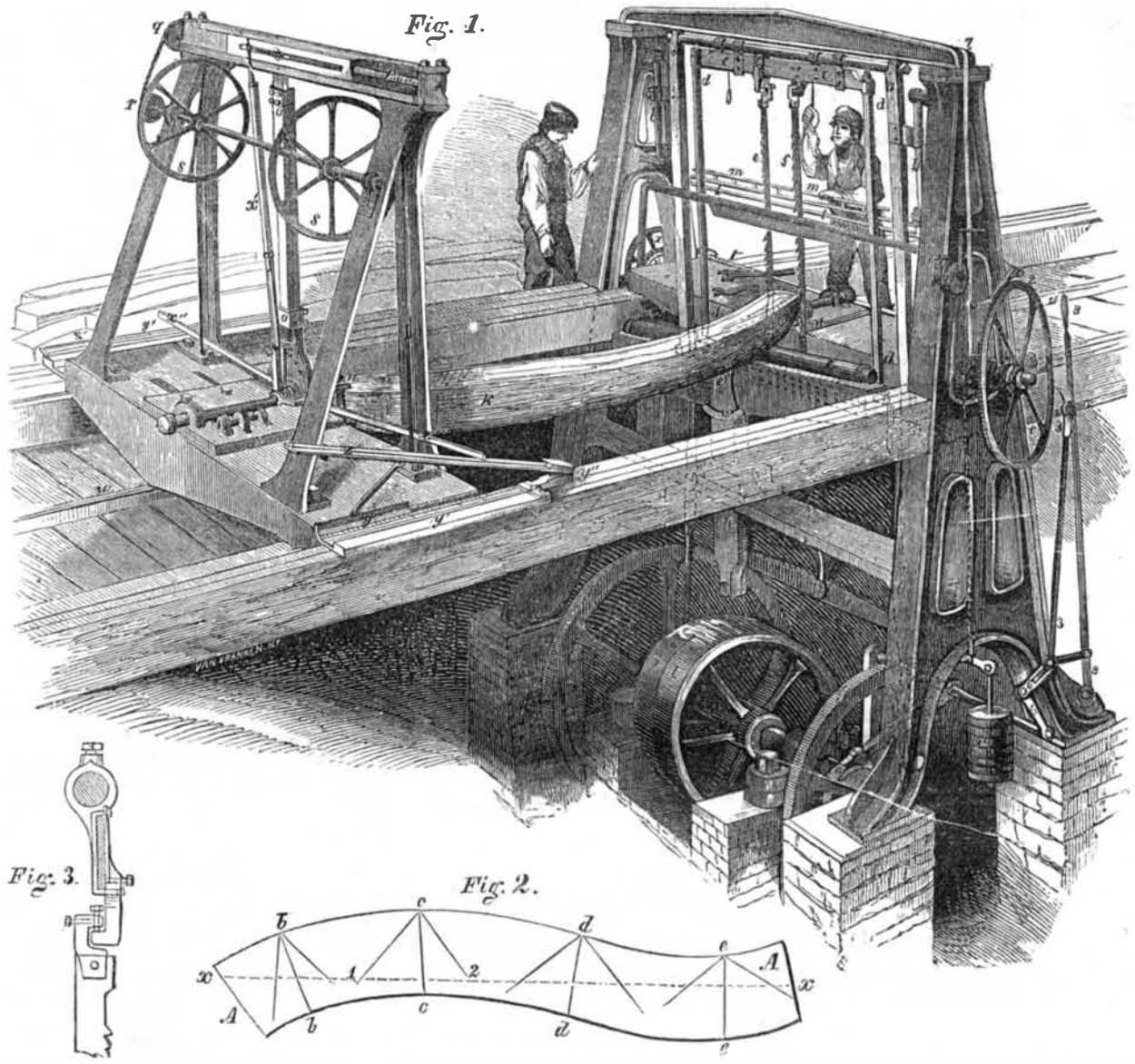

Fig. 3.

Fig. 2.

The timber, *k k*, is confined in chucks *n*, *n*, at either extremity, each of which is mounted on a horizontal axis, allowing the timber to rotate freely; one of these chucks is fitted with a vertical lever, *o*, the upper extremity of which is worked laterally by a horizontal transverse screw *p*, to which the requisite motion is communicated by the wheel work, *q*, *r*, so that by turning the hand wheel *s*, any required bevel can be given to the timber.

These two operations,—curvilinear sawing and beveling—by no means exhaust the difficult problem of sawing ship's timbers; in addition, it is necessary to ensure with all the accuracy of which machinery is capable, the regular and systematic changing of bevels from one given angle to another, and this to take effect within certain specific distances marked upon the timber.

We return to some of the details of this ingenious arrangement, and draw the attention of our readers to the means of securing a bearing for the timber in front of the saws. This, however, must be regarded, from the rigidity of the timber, and the little strain exerted by the operation of two saws, rather as an accessory than as a necessary accompaniment of the machine. It may be briefly described as follows: a roller, *t t*, is mounted on a swivelling frame, *u*, and possesses a vertical as well as a bevelling motion. The weight of the roller is balanced through the beam, *v*, *v*, by the adjustable weights, *x*, and the roller may be either elevated or depressed by the windlass, *y*. It is thus free to follow the surface of the timber, and is made to communicate an upward pressure by the same means; and thus support is given to the timber as may be required.

The method of feeding is, as usual, by means of a rack on each side of the travelling frame, *w*, *w*, worked by the pinions, *z z*, on the shaft 1 1. The rachet wheel, 2, on the same shaft, is moved by the pawl and rod, 3, 3, which is connected to an eccentric, 4, on the crank shaft, through the levers, 5 and 6. A means is provided of varying the feed by shifting the lower centre of the rod, 3, along the lever, 6, which is thus virtually shortened. This is effected by moving the hand lever, 8, into the various notches in the plate, 9, bolted on the side of the stationary frame.

By the foregoing description it will be seen that when the log passes through the machine without being rotated, it can be cut in any desired curved line by the slide of the saws transversely in the gate as the sawing progresses; and by adding to this facility that for turning the saw itself and for revolving the log, any required bevel or winding cut, so often required in shipbuilding, can be made.

We will now suppose that a line is drawn on the top of a log, and the cut at one end has to be parallel to one side of the log, but that at a certain distance, say three feet, from the end, the cut is required to be at an angle of fifteen or twenty degrees to the side, and the cut has to be a gradual twist until it arrives at this point; now, in order to indicate to the workman how to revolve his log so as to come to the required bevel at the point indicated, the following method is used.

The pointer or index, *x'*, on the axis, *o*, is to be turned either to the right or left to the angle from a perpendicular line, required for the difference of change in direction between the beginning and end of the cut, and this corresponds with a point marked on the board, which is seen above the index, *x'*. To this pointer, a lever, *x''*, is connected. The workman then takes an inclined bevelling bar, *z'*, which is set so that it can be shoved back and forth on rails, that run parallel to and on the sides of the rails carrying the head block; this bar, *z'*, is fitted so that it can be inclined and sustained at any required point by a pin or click in a vertical standard.

If the cut is to be three feet to the given angle, this bar is shoved along on its rail three feet beyond its point of contact with the lever, *x''*, when in a horizontal position, and then the bar, *z'* is to be inclined to such an angle as to bring the index, *x'*, to the point marked upon the board already mentioned (the angle of the first bevel.)

This index board is fitted to slide across the head block, and by means of a slot and screw is connected to the nut on the screw, *x*, that connects with the bar, 3, and rolls the log as the screw, *x*, is turned.

On setting the mill to work, the head block and levers, *x'* and *x''*, are carried along as the sawing progresses, and the lever, *x''*, slides

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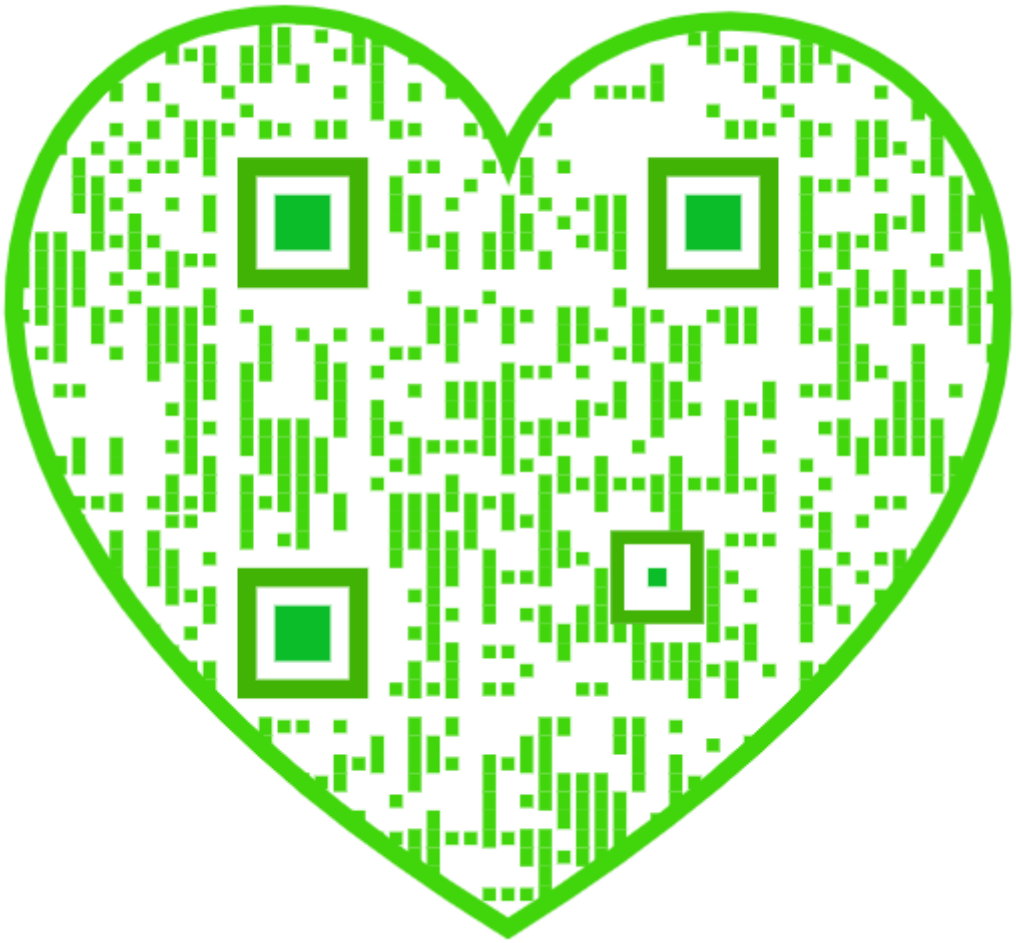

down the inclined bar, z', until when the head block has traveled the given distance (three feet), the index, x', is vertical, therefore all the workman has to do, is to keep turning the screw, x. by the hand wheel, A, and gearing, which rolls the log and carries the index board across the head block, consequently, by keeping the point marked opposite the end of the index, x', the cut will be gradually brought to the required angle when it arrives at the given point; thus a continued variation in the curve or twist of the cut can be made from this point by proceeding as before, and the curved or twisting cut be made in either direction, according to which of the levers, x'', are connected to the index, x', the beveling bar, z' being on the proper side of the head block.

We regard this as a very important invention. We have seen it in operation, and can speak with confidence of its merits. It is without doubt capable of making an important revolution in the process of ship building. It is certain that by this arrangement of machinery a timber can be sawed to any desired shape, and this with rapidity and precision, and we are confident that shipbuilders will consult their own interests by introducing it into their yards. A machine is on exhibition at Tupper's Foundry, Avenue C, near 11th street.

For further particulars, address the U. S. Patent Ship Building Company, No. 30 Merchants Exchange, New York.

Varnish for Patent Leather.

The process followed in France for glazing leather is to work into the skin, with appropriate tools, three or four successive coatings of drying varnish made by boiling linseed oil with white lead and litharge, in the proportion of one pound of each of the latter to one gallon of the former, and adding a portion of chalk or ochre. Each coating must be thoroughly dried before the application of the next. Ivory-black is then substituted for the chalk or ochre. the varnish slightly thinned with spirits of turpentine, and five additional applications made in the same manner as before, except that it is put on thin and without being worked in. The leather is rubbed down with pummice-stone powder and then varnished and placed in a room at 90°, out of the way of dust.

The last varnish is prepared by boiling ½lb of asphalt with 10 lb. of the drying oil used in the first step of the process, and then stirring in 5 lb. copal varnish and 10 lb. turpentine. It must have a month's age before it is fit for use.

Telescope for Amherst College.

The Hampshire "Gazette" says that Alvan Clark of Cambridgeport, has received an order from Amherst College, for a telescope, the expense of which, cannot be less than $1,800.—It is to be the gift of Hon. Rufus Bullock, of Royalston, Mass., a man who is the architect of his own fortunes and is fruitful in good works. Mr. Clark, who makes the telescope, is a wonderful man. Aside from the fact of his being one of the best portrait painters in Boston, he is an indefatigable and successful astronomer. He has discovered several new stars, and made out several double stars, which are not put down in any of the catalogues.

Blowing up the Ice.

Several experiments have recently been made at St. Louis, to see whether it were practicable to open a channel across the river, for the ferry boats, by blowing up the ice with powder. A two gallon keg, filled with powder, was sunk to the depth of twelve or fourteen feet, near the Illinois shore, and it was fired by means of a blasting fuse, run through a copper tube. The explosion produced no effect except cracking the ice for some distance around, and making a loud report.

Wonderful Invention.

One of our exchanges says:—An invention has been lately patented, which promises to effect a new era in locomotion. It consists in the application of india-rubber, working, when extended in contrary directions, on two axles, which communicate with the wheels of the carriage. The model, it is said, works admirably, and it has been pronounced by some of the first engineers in Manchester as likely to be eminently successful. Pro-di-gi-ous!

Imponderable Agents.---No.10.

[Second Series.]

Heat, Light, and Electricity.—The theories of these three great powers of Nature may be divided into three heads: 1st. That Light, Heat, and Electricity are but different qualities or actions of all matter, developed under different conditions. 2nd. That they are different qualities or actions of one subtle fluid, developed under different conditions. 3rd. That they are phenomena of three different subtle fluids.

None of these theories are new. Light, as we have stated, was believed to be the motion of a subtle fluid, by Descartes; electricity has always been considered a fluid, and by Du Fay, as two fluids. Heat has also been held to be a fluid of inappreciable tenuity, with particles endowed with indefinite idio-repulsive powers, as described by Dr. Ure and other scientific writers.

There is so much of which we are ignorant, connected with the phenomena of these three powers, that we dare not advance any dogmatic opinions, in favor of any one of the theories.

The term "imponderables," applied to these powers, is not a correct one, for it means something destitute of weight, therefore not subject to the law of gravity, and until we find some material substance, possessing this quality, it is just as applicable to an action or a motion, as to light or heat. There may, indeed be a subtle elastic fluid throughout space, which has not been detected by our yet imperfect instruments. A substance bearing the same relation to hydrogen (in weight) that it bears to platinum could not be weighed by any instrument in our possession.

Heat.—The only apparently good argument in favor of heat being a substance—an elastic fluid—is, that it expands bodies, to this we may add another, viz., generating heat by friction. Neither of these positions, however, are strong. Cold expands bodies, as well as heat. Water expands by the addition of 180° from 1000 parts by measure to 1045—1 in 22. Water contracts in bulk by lowering its temperature until it reaches 40° but below this temperature it expands. If heat is a fluid, it should expand ice or water at the freezing point, but when heat is applied to water at 32°, instead of expanding, it contracts in bulk, until it arrives at 40°, when it expands with every increment of heat. Some may suppose that ice contains air and is indebted to it for its greater bulk than water; but this is not so. There is more air in water than in the ice of our large lakes. The water in freezing gives out its air, and in all our rivers and lakes, there are huge air crevices and rents, to allow the air to escape, as the water freezes below. By experiments with pure Norway ice, Prof. Donnet, proved that it could be heated up to 300° under oil at which point it exploded like water at the same temperature deprived of all its air. If a strip of gutta percha be plunged into boiling water, it contracts both in length and breadth. Dr. Ure calls this "a remarkable phenomenon apparently opposed to all the laws of heat."

It would also appear from Count Rumford's experiments, that by a moderate degree of friction, the same piece of metal may be kept hot for any length of time; so that if heat were a fluid contained in the pores of metal, the heat pressed out by friction must be inexhaustible, which is simply an absurdity. Sir Humphrey Davy believed that the phenomena of heat might be referred, as he says "to a vibratory motion of the particles of common matter, or a motion of the particles round their axes, or a motion of particles round each other." It is no argument in favor of heat being a universal fluid, to say "it is latent in cold bodies," for latent means an insensible quantity, not what heat is in itself.

Electricity—Franklin's theory of electricity is, that it is a single fluid, and is as follows:—"All bodies are endowed with a certain quantity of electricity, if they have more than their natural quantity they are electrified positively; if less, negatively." Du Fay's theory which is the oldest is that electricity is composed of two fluids,—one the positive, the other the negative (vitreous and resinous are also names used for these fluids.) The term "pole" is given to the ends of the wires of a battery from which the electricity proceeds; the zinc being the positive one. This term is given to the ends of the wires, from a belief that they are possessed of attractive or repulsive forces. Prof. Faraday denies the existence of such forces, and asserts that the poles are only doors or pathways for the current. He has therefore substituted the term *electrodes* for the positive and negative poles of a battery. The pole where the current enters the decomposing substance, he names *anode*, from the Greek word signifying upwards, or the way in which the sun rises. The point where the current issues from the decomposing substance, he calls the *cathode*, or downward, following the course of the sun. Decomposition he terms electrolyzation. Although electricity is generally believed to be a fluid; it has never been discovered to possess gravity, or to have increased the bulk of bodies that have been charged with it.

Light.—Having said so much on this interesting branch of what is termed the imponderables, we will add but a few remarks now, and that for the simple purpose of saying that T. Bassnett, in a work recently published by D. Appleton & Co., of this city, has founded his "Mechanical Theory of Storms," on the supposition that all space is filled with a subtle imponderable elastic fluid, like that described by Euler, the motions of which produce light.

The identity of the three *imponderables*, is no new idea. Sir Isaac Newton put forth the query whether light and common matter were not convertible into one another, and he also adopted the idea that the phenomena of sensible heat depended upon the vibrations of the particles of bodies. Euler seemed to entertain the idea that electricity was also derived from the same fluid as light. "Every new discovery," says R. Smith, a somewhat distinguished writer on Electrical Science, "appears to encourage the opinion of the identity of electricity, magnetism, light and heat." Light, heat, and electricity can be obtained from a solar ray, and from the galvanic current.

We have thus presented many different opinions on the imponderables, that is, respecting their self, and combined identity. These different opinions do not affect our knowledge of the operations of these powers. Thus one philosopher attributes the rosy, golden, blue, and gray colors, displayed in the heavens at the rising and setting of the sun to the polarization of light; another ascribes the Northern Lights to the effects of electricity; both may be right, but it not, it does not affect our knowledge of these phenomena. This field still stands broad and expansive for future scientific investigation; at present we must plead to much ignorance; and when it is considered that photography is almost a new science; that it was unknown but a very few years ago, and that the moon is now made to paint herself with a pencil of her own gentle light, and that plates for printing are now executed by the sun, we may well speak modestly of what we do know, but hopefully of what we may yet know. With these remarks we close the series of articles on Heat, Light, and Electricity.

Setting the Journals of Carriages.

Some time since an inquiry was made through our columns respecting a correct rule for setting the spindles of carriages. The following are three letters sent us in answer to that inquiry:—

Eckmansville, Ohio.

The following is the method which I have practiced for a number of years in setting the journals of carriages:—

To make the carriage track five feet on the ground, I weld the axle four feet six inches, between the shoulders, and then ascertain what the difference of size is between the butt and point of the spindle, (generally it is made about 3-16ths of an inch). I then take off the collar or hurder, heat the axle at the shoulder and set each spindle down at the point 3-16ths of an inch—or somewhat below a straight line, which is ascertained by placing a "straight-edge" on the top side of the axle from one shoulder to the other, I next set the point of each spindle 1-32nd part of an inch forward, or until it comes within 1-16th of an inch of a straight line in front of the axle, which will leave one-third of the difference on front of each spindle point, and two thirds on the back. When the carriage wheels are made, with the proper dishing, say about three fourths to one inch, this rule will gather the spindle so that the carriage wheels will stand 1¼ inches closer on the front than on the back. The front wheels will then stand five feet apart on the ground, and five feet 3½ inches on the top, the hind ones over five feet on the ground, and five feet four inches on the top.

I have never known a spindle to heat or cut, when set according to this method.

Jos. R. Gates.

The question of setting the spindle of carriages, is one of no small importance, but the first question to be asked, is "why do the spindles of carriages require a peculiar set?" It is perfectly clear, that if the wheels of a carriage were not *dished*, and if roads were perfectly level, that the spindles of carriages should be of one uniform thickness and set perfectly straight. But as wheels require to be *dished* in consequence of uneven roads, something is necessary to obviate this difficulty. As the *dish* of a wheel is the first cause of alteration, the amount of *dish* must determine the amount of spindle alteration, (more dish is required in burden than light wagons.) The spindles should always be straight underneath to allow the wheels to play easily; the tire of the wheels should always stand on the ground under the center of the spindle, therefore the taper of the spindle must correspond with the dish of the wheel. The point of the spindle should stand slightly forward, to obviate the difference, (called "the *gather*") of friction between the large and small end of the journal; the amount of *gather* is also in proportion to the *dish* of the wheel. Now I think it is self-evident, that the surface of the ground bearing on one part, and the load on the spindles on the other, and then meeting at right angles, must necessarily cause less friction, than by any other plan. Many mechanics, however, suit their own convenience, leaving science to follow after, if she will. If a pitman should be hung at right angles with its crank, so should the ground be at right angles with the carriage spindle, and the place of contact should be "the centre."

Another question once asked in the Scientific American, "why do some wheels rise over an obstacle easier than others?" is much easier answered than the former. Some spindles are much larger than others, and these have an advantage in the incline of the spindle. A waggon built for rough roads, such as "log paths," should have the spindles of its axles made large; they tend to prevent rebounding; for smooth roads, however, large axles, increase the friction.

Thomas Mills.

Clearfield Pa.

In reference to the setting of carriage spindles, there is one point on which—I believe—all carriage makers are agreed, namely, that the spokes underneath the hub should describe a perpendicular or plumb line to the ground; this being the case, I will say nothing about the *gather*. The first thing to be examined is the size and *dish* of the wheel. This being found, get the center of the journal on the side against the shoulder and then strike a horizontal line on the axle from the centre, to the distance of half the size of the wheel, here mark a cross, by the square, and then measure up that line, from the horizontal, the distance of the dish of the wheel. From the last, strike a line to the center of the journal before mentioned, and prolong it as far as the length of the journal. Then if that line strikes across the center of the end of the journal, it is correctly set, if it does not, the journal must be modified until it does so. This is the rule I have laid down.

J. H. Cook.

Salem Iowa.

The diving bell was first used in Europe in the year 1509. It was used on the coast of Mull, in searching for the wreck of a part of the famous Spanish Armada, some time before the year 1669.

We are indebted to the Hon. S. A. Douglas for a copy of his letter on River and Harbor Improvements.

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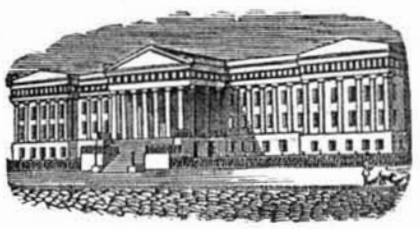

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 7, 1854.

ROTARY ENGINE.—Ebenezer Barrows of New York City. Patented in England, July 3, 1851: I claim, first, the revolving steam wheel, having projecting rims, or flanges, revolving within the interior of a stationary cylinder, in which, there are two or more fixed abutments or stops, which fit steam tight, so as to close and divide the annular space, between the cylinder and wheel, into two or more steam chambers. The said steam wheel having four or more pistons, whose operation is controlled by a stationary curved groove or way in each cylinder head, so as to be alternately acted upon by the steam in the cylinder, and drawn with in the wheel, so as to pass and clear the abutments or stops, substantially, as shown.

I claim, second, the six way cocks, or steam heads, having each a steam passage leading to its plug seat, two steam passages leading from its plug seat to opposite chambers of the cylinder, two exhaust passages leading from opposite chambers of the cylinder back to the plug seat, and one leading from the plug seat to the exhaust pipe, their cock plug being provided with suitable openings and passages, to make communication to or from the steam and exhaust pipes, to either division of the cylinder, or to close both, as explained.

I claim, fourth, the mode of uniting the face and side packing pieces of the pistons and abutments, so as to make them steam tight, at their corners by dovetailing them, as shown.

I further claim, making the steam cylinder within, and a part of the piston wheel the stationary rim forming the outer side of said cylinder, so that three sides of said cylinder shall revolve with the pistons, as set forth.

[See engraving of this invention, on page 25, vol. 8, Scientific American. A curious history could be written of this case had we time to enter into it—the application was pending before the office nearly four years, and a vast quantity of stationary, has been consumed, and a great deal of argument employed in getting it through. There is no doubt of the genuine validity of the patent, as every objection raised by the office has been successfully and pointedly met. Almost any other man except Mr. Barrows would have been disheartened long ago, in view of the repeated defeats, which he has met with, and we hope he will now realize something handsome as a reward for his preserving energy. Patents have also been secured for this engine, in Great Britain, France, and Belgium, through the Scientific American Patent Agency.

DENTAL CHAIRS.—A. Merritt Asay of Philadelphia, Pa.: I claim moving the chair seat vertically by means of the screw wheels, shafts, rack, and arms, as set forth.

TURNING LATHES.—Edward Bancroft, & Williams Sellers, of Philadelphia, Pa.: we claim the method of varying the motions of the mandril and screw or leader, by means of the two series of wheels, each series consisting of wheels of different diameters, and all the wheels of one series, being connected and turning together, and imparting motion to all the wheels of the second series, with different degrees of velocity, substantially as described, when this is combined with the method of locking, any one of the wheels of the second series with the shaft of the screw or leader, by having the wheels on separate sleeve arbors fitted to turn on each other, and adapted to receive a locking pin or bolt fitted to holes in a plate attached to the shaft of the screw, as specified, or any arrangement effecting the same end by means substantially the same.

We also claim the manner of supporting and sustaining the screw or leader by combining therewith a trough, as specified, having the outer end of the said screw or leader without a journal, as set forth.

MACHINES FOR RULING PAPER.—John & William McAdams, of Boston, Mass.: we claim first, a machine for ruling paper, in which, both the horizontal and vertical lines of the sheet are ruled in passing once through the machine, by any arrangement of devices which carries the sheet, after one set of lines is ruled, in a direction at right angles to its first course to another set of pens which rule the sheet across the lines first made.

Second, we claim changing the direction of the movement of the sheet, after passing from the first set of pens, by means of the travelling band, and revolving drums, as described.

Third, we claim lifting the pens so as to leave a heading to the sheet, by means of the roller, with its moveable tongue and cam projection acted upon by the edge of the paper and the motion of the feed roll, so as to lift an adjustable arm connected to the pen holder, as described.

Fourth, we claim forming grooves in the feed rolls, so that the pens may rest over these grooves and not upon the rolls between the passage of the different sheets, as above set forth.

Fifth, we claim guiding the sheet straight to the second set of pens, after the direction of its movement is changed by means of the converging bands which carry the edge of the sheet against a proper guide or against the side frame work of the machine, as specified.

Sixth, we claim forming the last roll which carries the sheet after it is ruled to the receiver, of a polygonal or angular shape, so that its revolution may give a vibratory motion to the sheet for the purpose specified.

MACHINES FOR MAKING NUTS.—Jacob Reese, of Sharon, Pa.: I claim, first, the use of the trough of cold water in combination with the rotating die box, for the purpose of cooling each die or mould after it has discharged its nut, and preventing the water from coming in contact with other parts of the machine, or with the nuts which are made in it.

Second, I do not claim the rotating of the mould box, but I do claim the use of the guide head, constructed as herein before described in combination with the lever, and guide for the purpose of communicating to the rotating mould box the peculiar motion required, consisting of a succession of sudden yet steady quarter revolutions, each followed by a pause or rest, during which the mould box is held firmly in its place in the manner described.

WINNOWERS.—Michael Shimer of Union Township, Pa. I do not claim the adjustable side alone but I claim the moveable side in combination with the inclined screen, said combination subserving three purposes, for preventing the grain from passing over the edge of the screen until it has been properly presented to the blast or draft, for partially cutting off the draft, as the state of the grain may require, for expanding the draft of the blast in such a manner that the pure grain will not be carried over, into the horizontal part of the trunk.

Second, I claim the square rubber in combination with the circular flanch formed on its lower extremity as described for the purpose of mashing or grinding all impurities, softer than the wheat, and also for preventing the grain from passing out of the bottom of the hopper before it has been thoroughly pulverized, as described.

WINNOWERS.—Josiah Turner, & W. C. Steroc of Sunapee, N. H: we do not claim the toothed cylinder or thresher with its corresponding toothed concave, nor do we claim either of the devices described separately.

We claim the combination of an oscillating cradle of slanting slat or blind work, as within set forth with the two blowers and the the fender, as set forth.

MAKING BATTERY CONNECTION WITH AN ELECTRO MAGNETIC COIL ON THE TRAVELLING CARRIAGE OF A TELEGRAPHIC REGISTER.—John M. Batchelder, of Cambridge Mass. and M. G. Farmer, of Salem, Mass.: we claim the combination of the system of progressive levers with the battery wires the base board and marble platform, so as to operate as specified.

POLISHING PLOUGH HANDLES AND OTHER ARTICLES.—Thomas Blanchard, of Boston, Mass.: I do not claim the invention of an endless polishing or smoothing belt, but what I do claim as new and of my invention, is the above described mode of applying and operating said belt with respect to the article to be smoothed or polished, the same consisting in not only making the said belt to traverse or run on sustaining pulleys or their equivalents, but at the same time to rotate such belt and sustaining contrivances in such manners around the article to be smoothed or polished as to cause the belt while in motion on its rollers to run in contact with and around the surface or article to be reduced, smoothed or polished.

I also claim, the combination of the feeding carriage, its guides, and the guide rollers or the mechanical equivalents therefor, with the endless polishing belt provided with machinery for imparting to it, its compound motion or movement in two directions, as specified.

MACHINES FOR CLEANING AND ASSORTING BRISTLES.—George Edward Burt, of Westfords, Mass., assignor to George Edward Burt, & David C. Butterfield, both of Westford aforesaid: I claim the combination of machinery for combining or straightening the bristles, and machinery for separating and assorting them as specified.

I claim the combination of the two moveable combs or rakes, and the two lifter wheels, and their carrying endless belts, so arranged as described, the whole being for the purpose of first holding the mass of the bristles by one part or portion of it, and lifting and combing the remainder of it, and subsequently seizing and lifting it by such combed part or portion, and combing the part previously seized all as specified.

And in combination with the machinery for combing or straightening the bristles, and machinery for assorting or separating them, I claim the endless guide belt, the spring band and rapping apparatus or hammer, as applied and made to operate, as specified.

I do not claim the combination of an endless platform, a roller, and a series of pressure rollers as employed in the hereinbefore mentioned machine of the said Lorenzo D. Grosvenor, but what I do claim, as of my invention, is the combination and arrangement of the two endless brush belts and two series of draft rollers, and their two sets of endless bands, as made to operate together and assort the bristles, as specified.

I claim the combination of the combs and their grooves, with the delivering rollers, so as to operate as specified.

BIT OR DRILL STOCKS.—Dexter H. Chamberlain, of Boston, Mass.: I am aware that a hand drill has been constructed so as to have its drill shaft supported in a stock and rotate, by means of two beveled gears, one of them being fastened on top of the drill while the other was affixed on a separate shaft disposed at right angles with the drill shaft, and having the crank applied, so as to enable a person to rotate it and thereby put the drill shaft in rotation, therefore, lay no claim to such a device, in the said drill stock as exhibited, the crank of it is made to rotate in a plane parallel to the axis of the drill shaft.

The consequence is, that during a rotation of the crank, there is an uneven pressure exerted on the drill, the said pressure being increased at one moment and diminished at another, and in the direction of the axis of the drill. A steady pressure on the drill longitudinally as well as laterally is very desirable particularly when a small drill is used, as without it the drill is not only liable to be broken or injured, but to be made to deviate from its desired course in passing through anything. The complication of the construction of the beveled gear bit stock, and the disadvantages incident to it while in use render it an instrument of little value and utility.

Neither do I claim making a tool stock and the bell crank in one piece of metal, so that their rotations may be equal and simultaneous, but what I do claim is the arrangment of the bell crank separate from, and so as to play or rotate within the tool shaft stock, as specified, the said bell crank having a spur gear to work into a pinion fixed into the end of the tool shaft, and to impart to said tool shaft an accelerated motion essentially as specified.

TOOL HOLDERS —Dexter H. Chamberlain of Boston, Mass.: I do not claim a split or jaw socket, having a screw and screw nut applied to it for the closing of its jaws upon the shank of an awl or tool inserted between them, but what I do claim as my invention, is my improved method of arranging, constructing, and applying together the jaws and confining screws, the same consisting in making the jaws separate from the screw shank, (on which the screw is cut) and in other respects substantially as described, and not only providing the screw nut with a closing concavity or socket, but the screw shank with a closing socket for the jaws to rest in, the whole being so that when the screw nut is screwed down upon the jaws, the combined action of the jaws and the screw nut shall operate to simultaneously close the jaws at their upper and lower ends as specified.

MANUFACTURE OF TIN FOIL OR SHEETS.—John J. Crook, of New York, N. Y.: I claim the New article of manufacture herein described that is to say sheets or foils composed of tin, and lead formed in separate strata, but so that the exposed or external surface shall be pure tin only for the purpose, set forth.

BLOCKS FOR HORSE COLLARS.—Louis S. Davis, of New Paris, Ohio: I do not claim as novel, the construction of a horse collar block in expanding sections.

I claim the four parted collar block of which the front pair of sections are hinged together at the gullet, and the back pair at the neck of the block, as described, the same being combined with a stationary bolt placed at the intersection of the partings, the said bolt serving to unite the base and cap, and also forming a fixed bearing for the right and left hand screw, which in conjunction with the pins on the block and the diverging grooves in the base and cap, effect prolongation and proportional lateral expansion of the block, or device equivalent.

OMNIBUS REGISTER.—F. O. Deschamps of Philadelphia, Pa.: I claim attaching the secret slide to the bolt of a lock, as described, so that it can only be moved to expose or conceal the numerals on the dials by a key which properly fits the lock.

I also claim, combining the secret slide with a stop bar, as described, so that both move together in such a manner that when the aparatus is left free to work, by the stop, the numerals on the concealed dials are not exposed and when the numerals are exposed to view the apparatus is made inoperative by the stop.

[This ingenious invention is noticed at length on page 260, Vol. 8, Sci. Am.]

METALLIC HUBS—J. B. Hayden, of Easton, N. Y.: I do not claim the flanges either with or without radial slots or recesses for the purpose of admitting the spokes.

I claim the disc, in combination with the recesses or saw cuts formed in the end of the spoke, into which the disc is fitted, and acts to secure said spokes in a permanent position, and effectually prevent them working in the hub, as described.

DRESSING SPOKES—By Ansel Merrell, of New Bedford, Pa. (assign or to Ansel Merrell & J. M. Irvine, of Sharon, Pa.): I claim the combination of the cam lever, having a screw thread thereon, with the adjustable dogs and supports set forth, whereby the rough stick or block may be held firmly at any required angle to the carriage and at a variable distance below the knives, in order that it may dress spokes of variable taper and of different length and thicknesses.

DAGUERREOTYPE PLATE HOLDER—Reuben Knecht, of Easton, Pa.: I claim the application of the eccentric wheel to the projection of the arms, which is effected by turning the swivel, which is firmly attached to the wheel aforesaid, and the application of the oblong aperture to the projection of either arm, according as one or the other of the arms require a further projection, for the purpose described,

SEWING BIRDS—J. E. Merriman, of Meriden, Conn.: I claim employing, in connection with a sewing bird, a spring tape measure arranged in a case placed directly under the belly of the bird; the said case being so situated that it may have, if desired, a handsome pin or needle cushion placed on its top; this arrangement rendering the sewing bird capable of measuring as well as holding the cloth while the sewing or measuring operations are being performed, and it also makes it more convenient for use and ornamental in its design, as set forth.

LIME KILNS—C. D. Page, of Rochester, N. Y.: I claim the form, as described, of the stock or cupola, in combination with the arrangement of flues from the fire chambers for the introduction of the products of combustion at the lower end, as specified, to insure the burning of the central part of the charge, as specified.

I also claim cooling the calcined lime preparatory to drawing it out and exposing it to the atmosphere by causing a current of cold air to pass through the saddle or its equivalent, placed at the bottom of the stack, and on to which the calcined lime descends, as described.

PLOWS.—John S. Hall, of Manchester, Pa.: I claim the hinges constructed in such a way that the edge of the front part of the mould board may lap over the edge of the back part or wing of the mould board to prevent clogging.

PORTABLE DOOR LOCKS—J. W. Webb, of Washington, D. C.: I claim the claws, in combination with the bar, and thumb-piece, constructed as described.

PLANING MACHINES—J. A. Woodbury, of Winchester, Mass: I claim, first, the combination of the rotary cutter, with the presses and bed.

Second, I claim the combination of the Bramah wheel, so called, with the rotating disc cutter and its accessories, for the purpose of planing, as set forth.

Eating and Drinking.

I believe that unwarranted and monstrous errors are propagated, by different writers, on the subject of food and drink. Each man has a whim or hobby, so that it has at length come to the point that if a man will live healthfully to a great age, say a hundred years, he must eat nothing but grapes and drink nothing but rain-water. The gentleman who advocates the grape diet contends that wheat bread ought not to be eaten, that it has too much earth in it, and tends to stiffen a man's joints and muscles half a century sooner than if he subsisted on grapes.

There are certain districts in the United States where new notions of every description flourish with amazing vigor, as far as the number of converts are concerned; among these mere notions are the injurous effects of tea and coffee as a daily drink.

I think that it is demonstrable that a single cup of weak tea or coffee at a meal, especially in cold weather, and most especially in persons of a weakly habit or constitution, is far more healthful than a glass of cold water.

Tea and coffee doubtless do injure some people—that is, some persons may not be able to drink them without its being followed by some discomfort; so will even water, if used too freely; and I think it will be found that, in nearly every such case of uncomfortableness after a cup of tea or coffee, this condition of things has been brought about by the too free use of these articles, or that the tone of the stomach has been impaired by improper eating.—[Hall's Journal of health."

Ammonia in Distilled Waters.

Boussingault refers to the necessity of determining the quantities of ammonia contained in well-water, river-water, &c. Since the time (1802) when De Saussure ascertained the first traces of ammonia in the air, since Brandes (1825) discovered it in rain-water, and especially since the time when Liebig distinctly proved this occurrence of ammonia, no complete investigations into the quantity of ammonia contained in natural waters has yet been made.

Boussingault has now begun to determine the ammonia in such waters by means of a distillatory apparatus. He regards it as certain that a water charged with a small quantity of ammonia will have given off the whole of this with the watery vapor when two-fifths of the water have distilled over.

We may, consequently, by submitting large quantities of water, as 10 litres or more, to a preliminary distillation, obtain a concentrated fluid, so as to treat this in the still set apart for the determination of the ammonia. Where the water is not too poor in ammonia, it may be placed in the apparatus itself.

The author then instituted experiments to test his method, and from these it appeared that distilled water to which a known quantity of ammonia had been added furnished more ammonia than had been mixed with it; so that apparently all distilled water contains ammonia.

Weak Eyes.

A number of our cotemporaries, have been lamenting over "the vast number of people who now wear spectacles," and assert that our grandfathers and grandmothers maintained their vision strong and clear for a greater number of years than we, "their weak-eyed descendants." This we think is a mistake. It strikes us that the present is just as clear and strong sighted as the past generation. Spectacles are cheaper than they were twenty-five years ago, and gold ones are very fashionable at present with some who have not the least necessity for their use; this may account for an apparent increase of weak eyes.

Manufacture of Steel.

The conversion of cast-iron into steel is desirable, if it can be effected rapidly and economically; for articles might be cast directly from a blast-furnace or a cupola, and then steeled to a greater or less depth, without altering their form, inasmuch as only a small quantity of carbon, a small percentage of the weight, is required to be removed. For a large number of purposes, this steeling need not proceed to a great depth, especially where toughness of body is not a requisite.

Attempts have been recently made to effect this decarbonization of cast-iron by burning off a part of the carbon in cast-iron, since it is known that the intermediate qualities of steel between bar and cast-iron are due to its intermediate state of carbonization. Riepe's process (Lond. Journ. Oct. 1850) is a modification of the process for decarbonizing cast-iron in a puddling-furnace by regulating the heat in the finishing process, and adding iron towards the latter part of the process. He also proposes imbeding cast-iron in clay and keeping it at the welding heat of steel, to effect the same purpose; and still further, the oxydation of castings by atmospheric air. The process of making malleable castings is also based on the same general principle. Such process, as far as we know, can only produce inferior qualities of steel, although they may possibly produce a material having exactly the due quantity of carbon; for as the metal is subjected to a comparatively small amount of working, a considerable proportion of the impurities, silicium, phosphorus, metals, &c. will remain in the mass and deteriorate the quality of the metal. The superior quality of steel is mainly due to a more or less perfect removal of injurious constituents, while, at the same time, much iron is oxydized and removed. By any of the processes yet known, it is impossible to avoid labor and loss of iron in making steel, and these seem to be in direct proportion to the quality of steel to be made. Late examinations by Miller of castings rendered malleable by cementation, seemed to prove that not only carbon, but even silicium had been extracted. This startling assertion needs further investigation; for, should it be confirmed, the present modes of making bar-iron and steel may eventually give place to, or be modified by, processes of cementation.

It would be an important addition to the metallurgy of iron, if we possessed a rapid, economical, and efficient method of partially converting wrought-iron into steel; for iron may be more conveniently forged than cast into many forms, and, if then steeled externally, or at certain required points, they would possess a core of tough metal with an exterior capable of being hardened. Hence, patents have issued and processes been proposed to effect this object; but we may conclude that the experiments have not been successful, since they have not come into general use. Charcoal, mixed with a little borax, salammoniac and saltpeter, has been proposed (Lond. Journ. xxxvi. 26) as a material to imbed articles forged of iron. As prussiate of potash has a marked effect in converting iron into steel, a bed of charcoal imbued with a solution of the prussiate might answer the desired end. The greatest difficuly lies in limiting the depth of the transformation into steel, since the depth seems to depend on the length of cementation, so that large and small pieces cannot be cemented at the same time in the same bed.—[Transactions of the Smithsonian Institute, Profs. Booth & Morfitt.

Manure Gatherer.

A. R. Hurst, of Harrisburgh, Pa., has invented an implement for gathering the manure of barnyards and sheds in heaps for greater convenience of loading upon carts. This is done by arranging upon runners a tool similar in its construction to an ordinary manure fork, yet larger and stronger, in such a manner that it can be set to rake the ground, gathering up the manure, or tilted so as to release its load. It is intended when used in yards to be drawn by a horse. The inventor has applied for a patent.

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New Inventions.

Machine for Cutting Garments.

John Harraday, of New York city, has invented a machine for cutting garments, the object of which is to cut out several pieces or thicknesses of cloth or other fabric at the same time, of a uniform size and shape, so that the corresponding parts of a number of garments or pieces of furniture may be produced by one operation. This is effected by placing them upon a table or bed, and conducting them in a proper direction towards the edge of a knife, having a reciprocating motion through the fabric and the table, in a vertical direction. The opening in the table is furnished with a sharp edge, projecting above the surface of the table, to prevent the cloth from being drawn in, and thus choking the knife. This is made of peculiar shape, and is capable of being turned so as to cut in any direction.

New Car Brake.

Alphonso Pernot, of New York City, has invented an improved rail car brake, which consists of levers with pawls attached to them, they being thrown backward, when it is desired to stop the car, against springs, by means of a chain winding around the axles, and thrown forward by means of the re-action of these springs when it is desired to start the car, the levers being made to act upon the wheels when thrown forward, by the pawls which catch into the teeth of ratchets on the inner side of the wheels. It will be seen that by this plan the momentum of the car is made to act upon the spring, and is reserved until the car is to be again started, when, by the re-action of the spring, the force required to start the car again will be materially lessened.

Improved Turning Lathe.

Samuel Carpenter, of Flushing, L. I., has invented a machine for turning hubs, tool handles, and other like articles, the novelty of which consists in feeding up to the stationary cutters, by means of a screw-feeding motion or other similar device, a square bolt of wood through a square hole in the center of the driving pulley, and also in an arrangement of a belt shipper, by means of which, when the bolt has been fed up the length of the article to be turned, the shaping cutter and another cutter for separating the hub or handle are brought into action, and the hub or handle is finished and cut off. When that is accomplished, the belt is returned by the shipper, and the bolt is again fed up. Quite an ingenious invention.

Shuttle Guard.

Peter Migget, of Hoosic Falls, N. Y., has made application for a patent upon a guard for preventing shuttles from being thrown out of power looms. Fastened to the back of the shuttle box is a piece of metal of such a shape as to form the top and front side of the entrance to it, and present a flaring opening for the shuttle to enter, by means of which, in combination with a guard and spring, the escape of the shuttle is prevented.

Improved Candle Mould.

Frederic Laudenbacker, of Buffalo, N. Y., has invented a new candle mould, the nature of which consists in the employment of a sliding frame with spools, and tightening rollers so arranged that all the candles may be withdrawn from the several moulds at one operation, and all the wicks tightened at once in the different moulds for the succeeding operation. The inventor has applied for a patent.

Improved Lock.

Elijah A. Freeman & Noah Rogers, of Waymart, Penn., have applied for a patent upon an improved Lock. The invention consists in the combination of tumbler catches and a guard, the operation of which is governed by a series of tumblers, and so arranged as to prevent the picking of the lock.

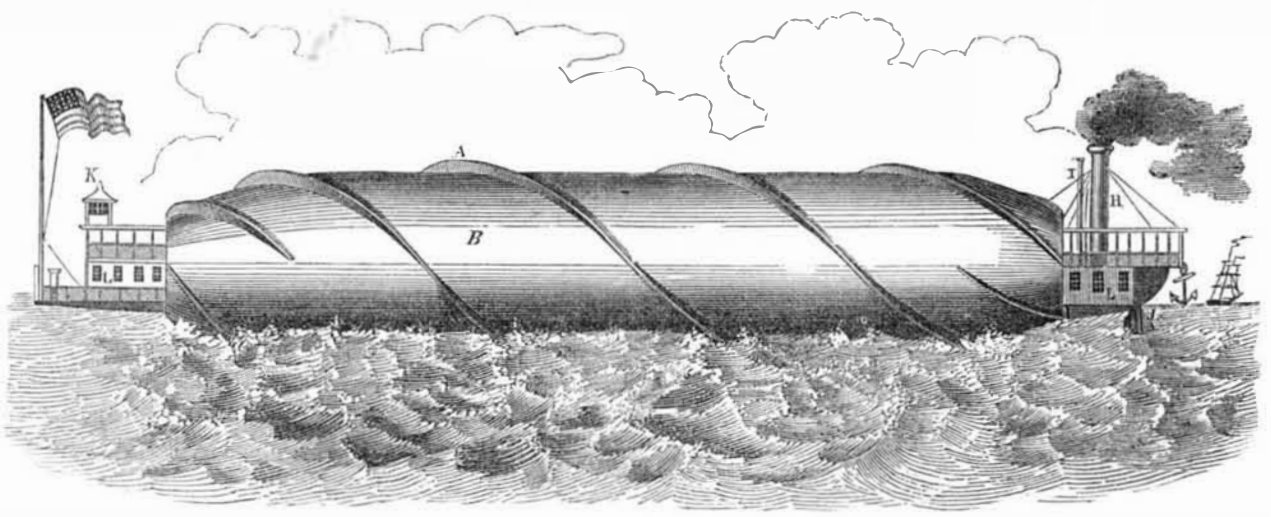
Rotary Engines.

Gerard Sickles, of Brooklyn, N. Y., has invented an improvement in Rotary Engines, which consists in making the revolving head with a flange on one side only, which flange has its inner face fitting to a suitable surface within the cylinder, while that face of the main portion or hub of the head opposite the flange, fits close to the bottom end of the cylinder; and admitting steam to act on the sides of the revolving head, thereby packing up the head to the cylinder. The pistons work between the flange above named and the bottom end of the cylinder, part of the cylinder being always open to the exhaust. The inventor has applied for a patent.

Prize for a Life Boat.

The Humane Society of Massachusetts offer a premium of $400 for the best Life Boat, and of $100 for the best carriage adapted to transportation of the boat, both to be tested in August next.

FROST'S MARINE LOCOMOTIVE.---Figure 1.

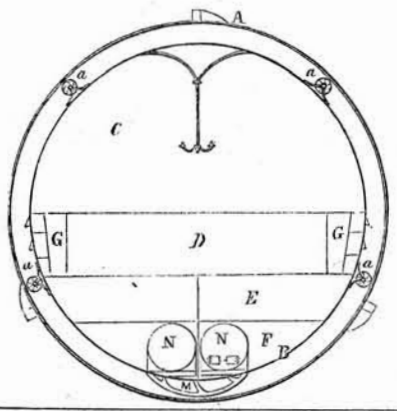


The annexed engraving is a representation of a Marine Locomotive, invented by Henry A. Frost, of Worcester, Mass. Fig. 1 is a perspective view, representing the outward appearance of the locomotive; fig. 2 is a transverse sectional view of the interior.

B is the outer rim or hull, to which are attached the screw blades, A; this is made to revolve by the driver wheel, M, which travels in a grooved track, forming an endless railway upon which the interior stands, supported by any number of wheels represented by *a a*. B, fig. 2, is the inner cylinder made water-tight, that in case of accident to the outer hull, the vessel may not sink. C is the saloon running the whole length of the vessel below which is the cabin, D, having rows of state-rooms on each side. E is the space intended for freight, while the machinery can occupy the lower portion, F.

I and H, in fig. 1, are the smoke and steam pipes; J is the rudder, and K is the pilot-house. L are portions of the cabin connecte p toL the interior cylinder through the opening at the ends, which must be far enough above the water line to prevent the water from entering. The interior is lighted from end to end.

FIG. 2.



The advantages claimed by the inventor are greater speed, safety, and simplicity of construction, which he is very confident will be the means of creating a complete revolution in ocean travelling. Its application is unlike anything now in use.

The inventor also claims that his arrangement will be liable to no head water resistance, as he thinks the manner in which the screw blades enter the water will effectually prevent this. Another gain to be obtained is the freedom from motion, as the inner cylinder being loaded at the bottom will continually maintain the same position. Easiness of repair, in case of accident at sea, to the outer cylinder, and a simple means of baling and ventilating the vessel, are also enumerated. As our readers will be able to judge for themselves in regard to this invention, we will say no more concerning it.

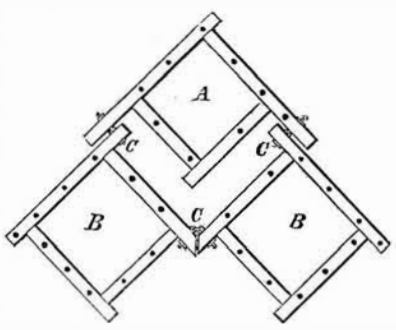
Further information can be obtained from the inventor, H. A. Frost, Worcester. Mass.

Ramsay's Flexible Harrow.

The above engraving is an illustration of the Harrow for which the first Prize Medal was awarded by the Jurors of the Agricultural Department at the World's Fair in New York in 1853, in competition with many others, including the great English Harrow, for which a prize of $100 was awarded at the Royal Agricultural Fair held in London.

The engraving needs but little explanation. The interior of square A should be two feet, squares B B 2 feet 3 inches; C C and D are joints made of hooks and eyes, working similar to the universal joint. This arrangement of parts and joints gives sufficient freedom of motion to allow the implement to accommodate itself to uneven surfaces.

We should think this an excellent harrow, the Scotch, the Geddes, and the common double harrow, are each liable to some objections to which this is not open. It is more flexible and we should think less liable to choke than the former, while no part of it can sway out

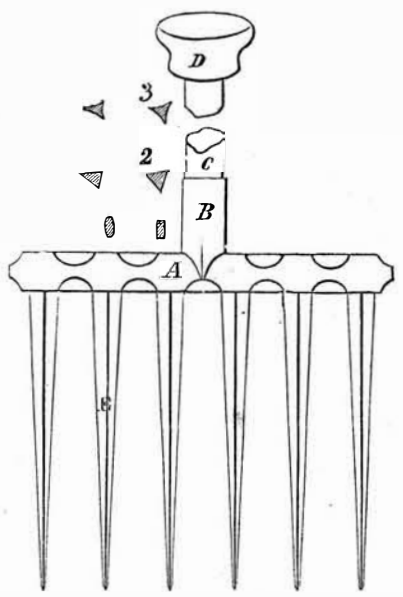


of the line of draught as can the latter. Ours is the greatest agricultural nation on the globe, three-quarters of all the capital in the United States, is invested in agriculture, and it is but due to American genius and the American nation that we should excel in inventions and manufactures in this department, and we feel just pride in knowing the fact, that we not only excel in the Thresher, Reaper and other like modern inventions, but also in the Plow and Harrow,—these two more ancient implements for tilling the soil.

For further information address the inventors, Wm. B. Ramsay, Strabane, Washington Co., Pa., or G. M. Ramsay, this city.

Improved Agricultural Fork.

The accompanying engraving is an illustration of an improvement in hay and other forks, for agricultural purposes patented by Benjamin H. Franklin, of Worcester, Mass., Dec. 20, 1853. The principal figure is a front view, and figs. 2 and 3 are transverse sections of the tines.



The nature of this invention consists in making the tines triangular, and so arranging them in the head that one of the flat sides shall be uppermost, the other two consequently receding from the opening in such a manner that any thing passing between the tines will slip through, and thus the fork will not be so readily choked.

The head or stock, A, may be made of wrought metal and provided with a ferrule or socket, B, fitting on the handle, C. The tines, E, are triangular, as will be seen in their section at figure 2, or the top may be flat or the under sides concave. The shank of the tines or that part of them which is fastened into the head is also three sided, and the tines are put in separate, so that they may be replaced when broken. They taper from heel to point in the usual manner.

The advantages of a three-sided tine over one of four sides, or a round one, are, the depth or strength of the metal is precisely where the most strain comes upon it, viz., perpendicularly and horizontally,—they present a flat surface for the material to rest upon—anything passing between the tines, cannot bind or choke, as the space below is wider than on top,—the material will more easily slip or slide off when thrown from the fork,—there is less metal and consequently less weight, whilst the same degree of strength is preserved—there are but three sides to finish up instead of four. The shanks being three sided, and also the hole into which it is riveted, there is one side less to dress and fit up.

Any further information may be obtained by addressing the inventor as above.

Oil Varnish.

Liebeg's method of preparing a good varnish is as follows. 1 lb acetate of lead, 1 lb litharge, and 5 pints water are digested together until the reddish color of the litharge has become white, from the formation of 1·6 acetate of lead, and filtered. 20 lb linseed oil, containing 1 lb litharge is added to the filtrate, exposed to the sun, and frequently shaken, until the varnish has become wine-yellow and clear, when it is filtered through cotton. It dries rapidly. An analogous method for poppy-seed oil prescribes 4 oz. oil, 2 oz. litharge, and 2 pints water, and directs that the liquid should be poured off, 8 oz. of the oil poured on the white basic acetate remaining, and exposed to the sun until it has become colorless.

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Scientific American.

NEW YORK, FEBRUARY 18, 1854.

Sales of Patents—Suggestions.

Almost every mail brings to us letters from inventors, asking our advice as to the best method of disposing of patents which they have secured. Having had no experience in the sale of patents, we are not familiar with any peculiar *modus operandi* by which they are readily converted into cash, but we have a notion as to the manner we should adopt if we had property of this kind to dispose of. We will give our views upon the subject and leave our readders to determine whether to adopt them or not.

The best time to dispose of an invention is immediately after the patent is granted. It has then a freshness about it which strikes the public mind that it is not only the latest, but as a matter of course, it must be the best improvement extant for the purpose for which it is designed. The patent has only fourteen years to run, and is therefore growing proportionably less valuable every day.

The restless activity of genius is such as to render it highly probable that some new improvement in the same branch, will at almost any time spring upon public attention, and thus exercise a strong opposing tendency to the success of the prior patent; this is an important consideration, and we have frequently, in our experience, observed its injurious effect, when in reality it should have no effect whatever. After a patent has lain one, two, or three years under an accumulation of dust and doubt, it is somewhat like shop-goods which have been brushed for the counter, and fed upon by moths until the nap is all gone, and the saleable qualities entirely obliterated. It is the active and persevering who are always in the advance ground of all public and private enterprises. The drone is expelled from the bustling hive of industry; this is natural and should induce within us an active and persevering spirit. Mankind have something to do besides burrowing in obscurity and sucking their claws for a sustenance from strength gathered in a few days from the natural bounties of the earth. The higher and more intellectual pursuits require a greater degree of mental energy.

It is one thing to produce, and it is another to render your productions a source of value and importance to the world. Every one should labor to turn to useful purposes the energies of their minds and the results of their labors.

That man lives in vain from whose hand no worthy action proceeds. Now the inventor who toils in quest of some improvement to subserve the useful purposes of mankind, should not be content with an inactive obscurity which is sure to follow sluggish endeavor: he should suffer the world to learn what he has done, and afford some opportunity for the public to reap the advantages of his efforts, while at the same time some share of the reward may return to bless and to incite him to renewed activity. If you have an invention, and it is of any intrinsic value, let the public become sensible of the fact. If you live in *Quietsburg*, there are ample facilities in this stirring age of steam, lightning, railroads, and newspapers in abundance to advise the public of your status or whereabouts, and of what you are doing to further the onward progress of the world in the arts and sciences. We can point to numerous instances where the publication of an invention in our columns has been the means of great profit to the inventor.

In No. 14 we published an engraving of a patented machine, and the inventor has lately written us, stating that he had sold nearly ten thousand dollars worth of rights, and received the cash. Poor as we knew him to be before he received his patent, he still had means to bring his invention publicly before at least sixty thousand readers, (for at the lowest computation three persons read every issued number of the "Scientific American,") all or nearly all of whom are directly interested in the improvements brought into existence by the worthy sons of genius.

Whether inventors select our paper or not as their medium, we urge upon them the importance of spreading before the people the fact that they have a good invention to dispose of and also where they can be found. —At the mere cost of an engraving, (which is never beyond the means of the humblest), we prepare and publish engravings of inventions, such as are likely to interest our readers. We cannot and will not accept of the ugly and uncouth efforts of those who sometimes attempt to palm off upon us what they are pleased to style engravings. We write and publish a paper for INTELLIGENT READERS, who look for some degree of perfection in what we present to them in weekly installments—whether it be in engravings or letter-press. Such engravings as we publish are executed by the best of artists in this line, and it is well known that our paper has a larger and more influential circulation than all the combined journals of its class now published; therefore it is right and proper that it should be the original medium thro' which inventors should present to the public a knowledge of their inventions. Second-hand engravings will be refused until our claim to their first use is more successfully contested than it now is by other scientific newspapers, —therefore, if inventors wish to make use of our unequalled facilities to let the public know what they have; they can do so by complying with our reasonable demands. We have no feelings of exclusiveness except those which rightfully belong to a publication of the circulation and influence of the "Scientific American."

Biography of an Inventor.

"Hunt's Merchant's Magazine" is an excellent work, and has no equal of its kind in the world, yet we must say that some of the autobiographies which are presented to the world through its columns contain statements altogether too highly colored; they may answer very well for fancy sketches, but scarcely come within the province of sober fact. In the last number (February, 1854) of this respectable periodical, there is a biography of E. B. Bigelow, a distinguished inventor and one whose name is more conspicuously associated with the power-loom for weaving figured fabrics than that of any other man, still we think that the author (N. Cleveland) is rather given to the use of a *free pencil*. Respecting the subject of the article—which is illustrated with a bad engraving of a very good-looking man—it is stated that having but *accidentally* witnessed the process of weaving coach lace, and having taken no notes of details—*only* remembering that hand looms were employed—and with only a piece of coach lace to guide him, he went home, invented and perfected a power-loom to weave the intricate fabric, and had it in operation within six weeks after its first conception. The plain inference to be drawn from such statements is, that Mr. Bigelow, perfectly *ignorant* of the art of weaving figured fabrics, and with only a piece of figured cloth to guide him, invented and finished a power-loom to weave such fabrics in about forty days. This we cannot credit. If it were true, then he certainly must be the greatest inventive genius that ever lived,—and before whose efforts, those of Fulton, Watt, Whitney, Evans, Morse, and Jacquard, become pale and spiritless,—those great men never performed a feat in invention like that recorded of Mr. Bigelow in this biography. That he has made many excellent improvements on carpet power-looms, we admit, and for this he deserves the thanks of the whole world, and we rejoice to know that he has been justly rewarded with something more substantial than mere thanks—pecuniary success —yet let us say that such highly colored and overdrawn statements as are made in this biography do him no good, but rather detract from his true fame. Those who are acquainted with the history of weaving will be inclined to believe that the information was furnished personally, and will be ready to attribute more than an ordinary share of vanity to its author; but we have the charity to believe that it is the product of an admiring and warm friend, who was not aware that Jacquard had invented the most ingenious and intricate apparatus connected with the figured fabric loom, before Mr. Bigelow appeared upon the stage of time, and that *he* only adapted this loom, as it was, and of which he must have had much knowledge, to be operated by steam or water in place of hand power.

If we are not much mistaken Mr. Bigelow obtained the second American patent for carpet power-looms; the first patent he purchased. In his undertakings he has been most successful, and to him our country is no doubt indebted for the splendid triumph of weaving figured carpets by power. He has a carpet factory now in operation at Lancaster, Mass., said to be the model one of the world. He has secured more patents for improvements in power-looms, than any person in our country. His looms are employed in all our principal carpet factories, and the carpets manufactured in his own factory, which were exhibited in the Crystal Palace. did credit to his genius and the taste of his pattern designer. It was he who adapted the power-looms for weaving the beautiful silk brocatelles, also exhibited in the Crystal Palace, and the only fabrics of the kind woven by power in the world. We are glad to know that he has obtained fortune as well as fame, and that while still a young man, these have been acquired by his inventions; may he live many years to enjoy the fruits of his genius and industry.

His life presents a hopeful example to all our young inventors. His first improvements were made when he was only 23 years of age, and his occupation—that of a physician—was altogether out of the line of making coach-lace and carpet looms. Many of the best inventions have been made by men who lived and labored at occupations very far removed from those which they improved and advanced by their genius.

Arkwright, the improver of the spinning frame was a barber, Cartwright, the inventor of the plain power-loom, was a clergyman; Fulton, the successful steamboat inventor, was a painter; Whitney, the inventor of the cotton gin, was a teacher. Genius is confined to no station, nor to any occupation. To every man, however high or low he may be, all the experience of the past and all the reasoning and wisdom of the present, reverberate the injunction,

"Act well your part, there all the honor lies."

Inventions New and Old.

Our cotemporary, the New York "Tribune,' of the 4th inst., contained a goodly amount of very useful and interesting notices of new inventions, four of which were obtained from the columns of the "Scientific American." We were very glad to see these, as the information —through our cotemporary—will reach a large class to whom it is of no small importance. At the same time it would have afforded us greater pleasure, had due credit been given to the source from whence such information was derived. There is no weekly paper in our country, from the columns of which so many original extracts are taken by our cotemporaries, as from the "Scientific American," and while some honestly give us credit, the great majority do not. We are not accustomed to make complaints on account of this, and we merely state the fact at present, relying on the generosity of our cotemporaries to do what is just and proper toward us in the future.

INDIA RUBBER WASHING MACHINE.—The "Tribune" of the above date describes an india rubber washing machine, which has recently been exhibited at Cincinnati. The description given of it by our cotemporary is taken word for word from page 348, Vol. 8, "Scientific American." We notice this fact merely that we may not hereafter be charged with copying remarks from the "Tribune" of 1854, into the "Scientific American" of 1853—*six months previous.*

The same washing machine has been on exhibition in this city, since the Crystal Palace was opened, and it is not a little surprising that it should not have been noticed by our cotemporary until it had traveled to Ohio, notwithstanding an engraving of it appeared in our columns.

THE STEAM BLAST.—We notice in the "Tribune" of the same date, that its Paris correspondent describes a wonderful new invention by Prof. Delabarre, which is stated to consist of the introduction of a jet of steam into the bottom of the chimney to increase the draught of steam boilers. The fact is, that this is the very principle which is employed on every locomotive in our country, and has been in use on every one we have seen, excepting the "Dummy" of Mr. Waterman, which was used for a short time, to propel the cars of the Hudson River Railroad through the streets of this city. In place of the blast, the "Dummy" used a blower—an old device, which was employed on the "Novelty," in 1828. M. Delabarre has certainly stumbled upon a modern *antique*; we did not suppose there was a single adult person living in a civilized country ignorant of the fact that the effect of every locomotive is regulated by its steam blast.

Notice to Subscribers.

HALF OF VOLUME NINE.—In three weeks from the present date the half-yearly term of a number of our subscribers will expire. We take occasion to direct the attention of such subscribers to the importance of renewing their subscriptions as soon as possible. It has often happened that subscribers have delayed doing this in the expectation of obtaining all their back numbers at any moment afterwards; but when they did apply, found to both their own and our regret, that we could not supply them. As so many of our readers desire to have their volumes bound, let no one delay sending in his subscription.

We also take occasion to say to our readers that the present is an excellent time for them to solicit their friends to become subscribers. No article will be left unfinished in No. 26, so that we shall commence the next half of the present, the same as if it were a new volume. The "Scientific American" is allowed on all hands to be the cheapest and best mechanical paper in the world.

Steam Carriages for Common Roads.

We see that steam carriages for common roads, are being again advocated and commented upon by a number of our cotemporaries. How in the name of science and common sense they can do this is surprising to us, in these days of railways and cheap locomotion. It might have appeared sensible to advocate steam carriages for common roads before railroads were invented, but not now. When it is considered that heavy rails and straight lines lessen the running expenses of railroads about 40 per cent.; and when it is considered that a 40 horse power engine will draw as much on a railroad as a 200 horse power engine, on a common road, the idea of using them on common roads is preposterous. The question is one of economy, and the man who advocates locomotives for common roads, when such superior advantages are obtained from railroads, forgets, that Rip Van Winkle sleeps no more.

A Marine Locomotive.

In answer to the letter of H. A. Frost, which was published in our columns two weeks since, respecting his sea-locomotive, we have received a communication from Morrison Foster, of Pittsburg, Pa., in which he states, that he invented a marine locomotive eight years ago, and in June, 1853, constructed a small machine which weighed about 1000 lbs, with which he moved over the water, carrying four persons with a considerable velocity; since that time, it has remained at the Hope Cotton Factory, in that place. He has not informed us of the plan nor construction of his vessel, and it may be entirely different from that of Mr. Frost, which we publish in this number.

Franking Letters.

Members of Congress who frank letters as a favor to private individuals are guilty of swindling the Government in a very low and contemptible manner. Parties who ask or accept such favors are engaged in a very small business. We would no sooner ask such a favor than we would beg the loan of three cents to buy a drink of New England rum. We almost daily receive letters franked by an M. C., from parties who have no connection with the Government, and upon business of a strictly private nature. Is this right? is this honest? We do not believe it is.

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Enameling Iron.

Having had many inquiries respecting the art of enameling metals, we present the following specification of a patent granted a few years ago, to F. Walton, of Wolverhampton, Eng., a practical tin plate worker.

This process consists in covering and ornamenting the surfaces of articles made of wrought-iron or other metal, with successive coats of partially vitrified and earthy materials, for the purpose of forming a glazed enamel surface, resembling earthenware, which may be painted with various colors, gilded, &c. The metals required to stand the process, must be able to withstand a red heat, such as iron, brass, or copper. The articles to be treated are subjected for a short time to a full red heat in an annealing oven, and sand may be interposed between them, to enable them to keep their form. They are kept at a full red heat for half an hour. Small articles may be heated in a muffle. After this the articles must be allowed to cool slowly, and when taken out must have their surfaces scoured clean and bright, free from all scale and grease, when they are ready for the first coat of the enamel. This is made as follows:—Take six parts by weight of flint glass broken into small pieces, three parts of borax, one part of red lead, and one of the oxyd of tin. These ingredients are pounded together in a mortar, and then fritted by subjecting them to a strong red heat in a reverberating furnace for three or four hours, during which period they are frequently stirred and turned over, so as to mix them effectually, and expel all volatile matter. Towards the latter end of the process the heat is increased so as to produce partial vitrification, when the whole is withdrawn in a pasty state, and dropped at once into cold water, which renders them easily broken and ground, and is named "frit." With one part (by weight) of this frit is mixed two parts of calcined bone ground to powder, and the whole mixture is then ground with water in a porcelain or other mill until no grit can be detected by feeling when a portion is squeezed between the thumb and finger. It should be of the consistence of thick cream and strained through fine cloth.

A suitable quantity of the semi-liquid is poured out with a spoon upon the surface of the article, which is held over the vessel containing the composition, and should be allowed to drain off the article upon which it is poured, by holding the article in a perpendicular position. Some articles may be dipped in the composition. The coating should be of uniform thickness, evenly spread, all air bubbles carefully displaced, and no defective places allowed. The coating will be better performed in a warm than in a cold room, and the article to be coated should be somewhat warmer than the enamel composition, which should be milk warm.

An article when coated—and the enamel is so dry as not to run—is laid upon three points of small supports made of earthenware, which stand upon a plate of iron, to carry it away to a japanner's stove oven, where it is kept at a heat of about 180°, until all the moisture is expelled. Defective places in the coating may be filled up by applying some enamel liquid with a brush. Great care must be exercised to have this—the first coat—carefully and well put on, as the success of all the subsequent coatings are dependent on this one. When the articles are perfectly dry they are placed in the vitrifying furnace illustrated in the annexed engravings, of which figure 1 is a transverse vertical section, and figure 2 a longituinal vertical section; the same letters refer to like parts, A A, is the oven or muffle built of fire bricks (set with fine clay) and which oven or muffle is closed at all parts, except at the end B, fig 2, which end forms the open mouth for introducing and taking out the articles to be fired.

The open mouth, B, is closed when required, by letting down the iron door, *d*, which is suspended in the manner of a sluice, or so as to draw up and let down in vertical plane at pleasure. D, D, are the fire-grates, of which there are two, side by side; the fire-places above the grates being separated by a brick wall, E, which sustains the middle part of the flat floor, *a*, *a*. At F, are the fire-doors (being at the opposite end to the mouth of the muffle, see fig. 2,) and which fire-doors, as well as the openings into the ash-pits beneath the fire-grates, are carefully excluded from the apartment into which the end, B, or mouth of the muffle opens, for the purpose of preventing any dust, or ashes, or smoke, which may at times rise from the fire-doors, and ash-pits, and which would otherwise affect the articles in such apartment, or during their introduction or taking out from the muffle. The heat of the burning coals on the fire-grate acts immediaiely beneath the flat floor, *a*, *a*, and the currents of heated smoke, flame, or gas, which proceed from the fire, pass away laterally from each fire-place, through flues, *e*, *e*, which conduct the current into a narrow space, *f*, *f*, by which the muffle is surrounded at each side, also at the remote end, and over its arched roof, *b*, *b*; and finally the said currents ascend through the three vertical flues, *h*, *h*, *h*, and from the upper end thereof, into the large chimney, F, the size of which is diminished at its up per part above the flues, so that the interior aperture is about eighteeen inches square at the top, which should be about twenty-five feet high above the level of the fire-grates, D, D.—There is also a direct ascent from the upper part of each fire-place, at *g*, fig. 2, into the space, *f f*, and the remote end around the muffle, and strong fires have to be kept up in the two fire-places, the heat ascending therefrom giving heat to all parts of the muffle, which is to be kept at a glowing red-heat, the uniformity of that heat over all parts of the flat bottom, or floor, *a*, *a*, on which the articles have to be placed, or to as great an extent as possible, being of much importance. Small slabs cut out of fire stone, or otherwise of fire-bricks, or of fire-clay burnt, and of a suitable size and form, are employed to serve as supports, and care must be taken that when an article is placed on a stand on the flat bottom, *a*, *a*, it shall not be interferred with by any other, or adjacent article; and after the whole of the muffle and the stands alluded to have attained a full glowing red-heat, the articles are to be introduced and not before, being carried to the muffle upon a flat slice, or otherwise an iron fork, with a long handle, is used for that purpose, so as to take up and deposit the articles with as little injury as possible, the sliding door, *d*, being raised as little as possible upon each occasion, and immediately afterwards closed.

Fig. 1.

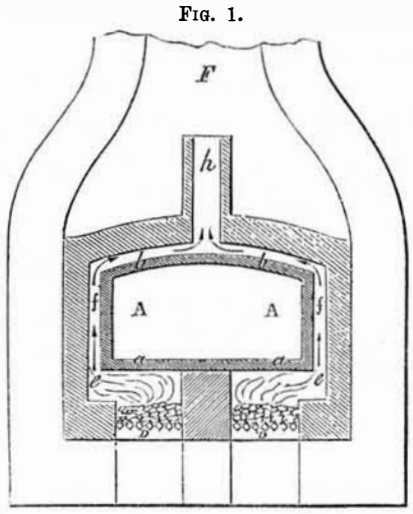
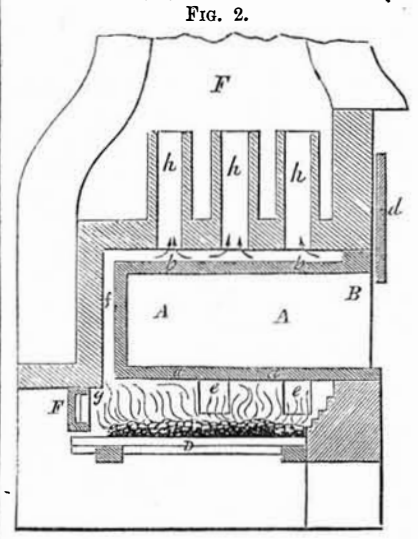


Fig. 2.



The articles are exposed to heat in this muffle until the coating is partially fused and adheres firmly to the metal, when they are withdrawn and laid on a flat iron bench to cool. When cold they have the dead whitish appearance of earthen (biscuit) ware, that has received its first firing. The time required for the articles to be in the furnace will be from a few minutes to half an hour, depending upon the size and number of the articles and upon the heat of the muffle. The operator will soon find out the precise time required for each article, and also the best heat to be used.

When the articles are cooled, after being first fired, they are dipped in water or wet with a sponge, and a second coating is applied as before described, then dried and fired in the same furnace, as has been described, only a different composition is used for the coating. This consists of 32 parts (by weight) of calcined bone; 16 parts of China clay, 14 parts of Cornwall stone, and 8 parts of the carbonate of potash; the latter is dissolved in water; the other ingredients are ground to powder, and the whole made into a thick paste, which is burned for three hours in a reverberatory furnace until it assumes the appearance of biscuit china, which is then to be ground down to a fine powder. Five parts (by weight) of such powder are then to be mixed with 16 parts of flint glass, broken into small pieces, 5½ parts of calcined bone, ground, and 3 parts of calcined flint, ground. This mixture is afterwards ground in a mill until it is very fine, and of a creamy consistency, after which it is carefully strained through lawn sieves, the same as has been explained in describing the first coating. In firing the articles after the second coating, they must be kept long enough in the furnace until the second coat is thoroughly incorporated with the first. The color of the articles, after the second coating and firing, is whiter than they were after the first firing and resemble good earthenware biscuit.

The articles having been twice coated and fired in order to be made to resemble the very finest white earthenware or porcelain, must be treated with another composition which is as follows:—Take 4 parts (by weight) of feldspar in powder, 4 of white sand, 4 of the carbonate of potash, 1 of arsenic, 6 of borax, 1 of the oxyd of tin, 1 of nitre, and 1 of whiting. These materials are to be mixed together and fritted in a crucible under a high heat in a furnace, until they are partly fused, and when cold have the appearance of a whitish enamel. They are then reduced to fine powder, and 16 parts by weight of it, are substituted for the 16 parts of flint glass used in the second coating composition. The flint glass is as good as this, excepting in color. The third coating is therefore the same as the second, excepting the 16 parts of glass; it is put on like the second, only it should be somewhat thinner. In firing the articles in the muffle for the third time, they must be subjected to such a heat as to cause the glass to be thoroughly vitrified, and to spread over the surface of the second coat, and become incorporated with it, so as to glaze its surface like that of the best earthenware. Another coating of the same kind, making four coats and firings, may be given to the articles to make a full and rich covering.

It would occupy too much space in our columns, at present, to give a full description of the different colors, and the mode of applying them for ornamenting enamelled metal articles. Suffice it to say, they are the same processes and materials, which are employed to ornament porcelain and fine earthenware. Any work therefore, which describes those materials and processes, either for the painting, of flowers, or gilding, affords information for beautifying and ornamenting enamelled iron.

Irish Potato.

On page 138, Vol. 9, Scientific American., it is said that the Irish potato was first brought to America by some Scotch immigrants from Ireland. Grimshaw informs us, in his History of the United States, that the Irish potato is a native of Mexico, and was first taken to Ireland about 200 years ago, by John Hawkins. We want the "true light" on this subject.

B. W. White.

[The Irish potato is a native of America, and was introduced into Ireland by Sir Walter Raleigh, but the described manner by which it was introduced into New England, to which our correspondents refers, is no doubt correct.

Our Prize Awards.

Messrs. Munn & Co.—I merely write to inform you that I have drawn on you for the amount awarded me for one of the Prize Lists to your invaluable paper. I was satisfied with your first award, and have only to say ditto to your second. I cannot refrain from adding my testimony to the value of the "Scientific American," and hope that its circulation may be commensurate with its merits. Among the 78 subscribers here I have heard no complaints, whilst many have said they were getting more than the worth of the subscription price.

Truly yours, D. M. Sechler.

Ironton, Ohio., Feb. 1, 1854.

Messrs. Munn & Co.—It is with extreme pleasure I find my name among the fortunate competitors for your list of Prizes, and that pleasure is the more enhanced by the short time I have been in this city, having only been here since the 17th of last May. On inquiring how many took your paper here, I found that there was only about sixteen, and when I commenced my club I had no trouble in getting the list I forwarded you, as your paper only had to be made known either to mechanics, farmers, and artists—in fact it never came wrong to any class. I hope the small effort I have made may be the means of giving your paper a still wider circulation. I will in a few days draw on you for the amount. Yours,

Charles Collier.

Indianapolis, Ind., Feb. 16, 1854.

[The amount due Mr. Collier is $45, and it will be seen by his own statement how easy a matter it is for any one to raise clubs of subscribers for the "Scientific American," who are so disposed. An inference may be derived from reading all the letters we have published from the recipients of Prizes, and it is this—that the "Scientific American" is a popular paper with all its patrons, and that but little exertion is required to obtain large subscription lists from every town and hamlet. We hope our friends will not forget these letters from our successful competitors, when the time arrives for offering prizes on a new volume.—Ed.

Ear Instruments for Deaf Persons.

Since we published a short extract—a few months since—taken from one of our foreign exchanges, respecting a small ear instrument (said to be invented by two Professors in London), by which deaf persons are enabled to hear with distinctness and accuracy, we have received a great number of communications on the subject. These communications are from persons afflicted with deafness, and they reveal to us the important and sorrowful fact that their number in our country, is far greater than we had supposed it to be. We are not acquainted with the London inventors of the instrument referred to, and cannot give any more information about it or its authors than what has already been presented through our columns. We take this occasion, however, to request our foreign scientific cotemporaries to give us some more information about it. If it possesses the good qualities with which it has been represented to be endowed, it will be of great benefit to many of our fellow creatures, and will find an extensive sale.

Financial Affairs of the Crystal Palace.

The report of the receipts and expeditures of the Crystal Palace Association made by the directors exhibits a heavy deficiency in their accounts. The association is now in debt over and above its capital stock, and the receipts from all sources to the sum of $125,000. We are prevented from saying anything regarding the matter this week, for the want of room, except to remark that this furnishes unimpeachable testimony to the improper management of the exhibition, and the result is just what we predicted before it opened, vide Vol. 8. Next week, we shall have more to say in reference to this matter.

A correspondent of the Philadelphia "Register," writing from Paris, states that cotton is now very extensively cultivated in Algeria, and that in a few years France will grow on its own soil cotton enough for its own manufacturing wants.

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TO CORRESPONDENTS.

J. M., of Ill.—We made no allusion to the blue and yellow calicoes; there is no necessity for giving them any chlorine; but all light clear blues should be bleached before they are dyed, or they will have a muddy appearance.

W. Y. G., of Ky.—If you propose using a gate saw attach it to a crank on the main shaft by all means, muley saws are, however, much the best, and these latter are often judiciously run with a belt.

W. S. F., of Ohio—Your press will operate, but it is of no value inasmuch at you never can obtain any more pressure than can be derived from the weight of the article to be pressed.

W. B. N., of N. Y.—We should suppose that your discovery is a valuable one, for the present pictures are all negative.

A. H., of Me.—There is not the slightest patentable novelty in your force pump. We presume it would operate well, but no better than some others.

O. C. C., of N. Y.—If you wish to procure a good double force pump, apply to Messrs. Cowing & Co., at Seneca Falls, N. Y.; they are large and very reputable manufactures.

J. G. P., of Ohio—The brake which you describe appears to be different in some respects from any thing which we have ever seen, but we fear it is too complicated ever to become a successful competitor of the simple plan now in use.

F. W. C., of Ohio—A pen having a hollow holder to be used as a reservoir for ink, which is fed to the pen by means of a tube, is an old device. Fountain pens of various construction have been employed to a very limited extent.

W. R.. S., of N. Y.—We have frequently seen a table and a settee combined in one piece of furniture. The plan which you describe embraces no new or patentable feature.

N. K., of Pa.—A door fastener no larger than a very small tobacco box is patented by Mr. Kittle. of Buffalo, N. Y. If you will send us one we can better advise you in regard to its novelty.

E. T. M., of N. Y.—Such a life preserver as you describe is not new. Experiments were made in this city some three years ago with Ralston's Preserver, which operated as a perfect and positive protection to the body of the wearer: the expense of the article is the only reason we can give why it has not been introduced into general use.

J. H., of Ind.—We cannot furnish the information which you seek in regard to the Geological Alphabets. We do not know who sells them.

S. W., of Ct.—The volume of Newton's Journal which yon want cannot be furnished by any one that we know of.

H. T. K., of Ohio—A band or clutch for clasping carriage hubs, secured by means of a screw bolt could not be patented. Such clasps are well known for other purposes, and their adaptation to this would not constitute a patentable feature.

G, E.. of Wis.—We do not discover anything in your alleged improvement in drills which could be patented.

E. M., of N. Y.—Pumps having buckets secured to an endless chain for raising water are old and well known. See Ewbank's Hydraulics, or any other work upon the subject. We find nothing new in your proposed plan.

M. M. G., of Ky.—The application of glass tubes to boilers for indicating the hight of water therein is not new.

D. B., of Ct.—Perhaps the burnish is finished by hard rubbing with a buff leather finisher.

P. R., of L. I.—It appears to us that it would have the same effect if the steam was up or off: but how are you then to apply it.

H. S., of Ind.—You may depend upon it, that your plan will not operate.

C. A. C., of Mass.—Get Clarke's work on Locomotives; it is now publishing in numbers at 62 1-2 cents each, by Blackie & Son, 117 Fulton st., this city.

J. D. L., of Pa.—You can render linseed oil capable of drying easily by boiling it for some time, and adding about 1 lb., of the sulphate of zinc to the gallon.

T. M., of Mass.—The logotype is now practiced in one office in this city; you could not obtain a patent.

R. J. N., of Ga.—You will never be able to obtain any useful or valuable power from permanent magnets.

J. M., of N. Y.—The subject passed from our recollection, but the new plan is not a good one.

S. W. D., of Ohio—If your plan for magnifying and reproducing objects on a magic lantern is new, then you can obtain a patent, not otherwise. The person who makes an improvement on yours, cannot use your plan when patented.

W. F., of Liverpool—We have marked your subscription up to Jan. 1st, 1855. After deducting the full amount of your subscription up to the above date, we find there remains your due $8,64.

C. G., of N. Y.—A machine (Foster's patent) for picking up stones was exhibited at the Crystal Palace—but it was incapable of doing what you claim for yours:—send us a model.

O. W. C., of Wis.—Arnot's Gothic Architecture, published by Appleton & Co., of this city will answer your purpose.

M. C., of La.—We have carefully read your specification of an improved process for tanning hides. A patent was obtained in England thirty years ago by Knowles & Dusenbury, for the same process, viz., extracting the air from skins in an air-tight vessel.

A. H. R., of Pa—Your specification and drawings had been sent to the Patent Office before your letter of the 4th reached us, but we think the former was correct as submitted.

Money received on account of Patent Office business for the week ending Saturday, Feb. 11:—

F. M. H., of O., $30: C. & J., of R. I., $35; J. S. S., of Md., $30: J. R., Jr., of Mich., $25; M. & B., of N. Y., $25: T. B. S., of N. J., $5: C. A. W., of Mass., $50: F. C., & S., of N. Y., $275; G. B., of N. Y., $250; V. & K., of N. J., $25; P. M., of N. Y., $25; B. S. W., of R. I., $110; S. H., of N. Y., $5: A. H., of N. Y.. $10: J. V. S., of Ohio, $25, S. H. D., of Mich., $30; W. W. & Co., of N. Y., $55; G. VanZ., of N. Y., $30; J. M., of Ct., $25: W. G., Jr., of N. Y., $15; H. T., of Ct., $30; A. P.. of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 11:—

M. & B., of N. Y.; J. R., Jr., of Mich.: V. & K., of N. J. G. W. F., of O.; A. P., of N. Y.; S. H., of N. Y.; R. S. T. of N. C.; H. W. A., of N. Y.; J. V. S., of Ohio.

A Chapter of Suggestions, &c

PATENT LAWS—The seventh edition of the American Patent Laws and Guide to the Patent Office, published by us, having been exhausted, we shall not be able to furnish orders under ten days or two weeks, Those who have remitted money for copies will be supplied immediately on the issuing of a new edition.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, providing they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engravings executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

TO CORRESPONDENTS.—Condense your ideas into as brief space as possible, and write them out legibly, always remembering to add your name to the communication, anonymous letters receive no attention at this office If you have questions to ask, do it in as few words as possible, and if you have some invention to describe come right to the business at the commencement of your letter, and not fill up the best part of your sheet in making apologies for having the presumption to address us. We are always willing to impart information if we have the kind solicited.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol. 8, none comple, but about 30 numbers in sheets,, which will be sold at 50 cents per set; of Vol. 9, none previous to Jan. 1st, 1854.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post-office also omitted Persons should be careful to write their names plainly when they address publishers, and to name the post-office at which they wish to receive their paper, and the State in which the post-office is located.

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THE AMERICAN PHRENOLOGICAL JOURNAL—A Repository of Science, Literature, and General Intelligence: devoted to Phrenology, Physiology, Education, Psychology, Agriculture, Horticulture, Architecture, the Arts, and Sciences, and to all those Progressive Measures which are calculated to reform, elevate, and improve mankind. Illustrated with numerous portraits and other engravings. A beautiful quarto. Published at $1 a year in advance, by Fowlers & Wells, 131 Nassau st., New York.

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TO LET—A Room 91 by 25, in a brick building with or without the use of a six horse engine, and blacksmith's shop. D. PRETLOVE, manufacturer of embossing machines, River street, East Brooklyn, opposite the Myrtle Avenue Stage Depot. 1*

WANTED—The first 8 Volumes of the Scientific American, or Vol. 1 only. DAVID DAVIDSON, 109 Nassau st, N. Y. 21 3*

1000 BOOK AGENTS WANTED—To sell Pictorial and Useful Works for the Year 1854. $1,000 a year! Wanted, in every county of the United States, active, and enterprising men, to engage in the sale of some of the best Books published in the country. To men of good address, possessing a small capital of from $25 to $100, such inducements will be offered as to enable them to make from $3 to $5 a day profit. The books published by us are all useful in their character, extremely popular, and command large sales wherever they are offered. For further particulars address, post paid,

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$500 REWARD—For an Invention to Prevent the Alteration of Bank Notes. To Chemists and others. In order to prevent the loss and annoyance occasioned by the ALTERATION of Bank Notes either by changing the name of the Bank, or the denomination of the Bill, as practiced by counterfeiters, and to procure an effectual barrier to such practices, by encouraging the invention of materials, such as ink and paper, of a nature to afford in either or in any combination of them, the desired protection—the Executive Committee of the Association of Banks for the Suppression of Counterfeiting, will pay the sum of Five Hundred Dollars to any person who shall invent the best mode, in the opinion of the Committee, of accomplishing the object named. All plans to be submitted to the undersigned on or before the 25th day of March next, and to be accompanied with such explanations of the materials and processes as the party applying may be willing to disclose. Each applicant to lodge with the Treasurer of the Association, Henry M. Holbrook, Esq., for the term of three months, the sum of one hundred dollars, which shall be paid to any person who shall, during that time, alter, by removing and printing anew, any material portion of a bill or note prepared in accordance with the plan submitted, in such a manner that the alteration would, in the judgment of the Committee, be likely to pass unsuspected. And if, at the end of said three months, no one has been able to effect such alteration, and the Committee are satisfied that the materials proposed will stand all the tests which the present knowledge of chemistry affords, then the hundred dollars will be returned, and the reward paid over to the successful applicant, and the hundred dollars deposited by each of the other applicants to be returned to them respectively. Per order of the Executive Committee,

J. M. GORDON, Secretary.
Columbian Bank, Boston, Mass., Jan 24, 1854. 22 7

UNITED STATES PATENT OFFICE.
Washington, Jan. 26, 1854.

ON THE PETITION of Allen & Wm. A Crowell, of Salisbury, Conn., praying for the extension of a patent granted to them on the 20th day of June, 1840, for an improvement in Churns, for seven years from the expiration of said patent, which takes place on the 20th day of June, eighteen hundred and fifty-four—

It is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of May next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; and Enquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 29th day of May next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 22 3

FOR SALE—An Established Steam Planing Mill and Sash Factory, in one of the healthiest of our Southern cities. There are are Beardslee's, Woodworth's, and Daniel's Planing Machines, of the best make. All of Fay's machines for the manufacture of sashes and blinds. Leaven's Patent Sash Machine, circular saws, &c. The engine is forty horse power, boilers nearly new. One of the proprietors being about to retire from business, the whole or one half will be sold on advantageous terms. Address P. E. HAMM, Esq., City Treasurer's Office, Philadelphia. 22 2*

TO PIPE MAKERS—And Iron Founders generally—G. Peacock's Patent Core Bar, for making all kinds of branches, elbows, curve pieces, or straight pipe of all shapes and sizes. This improvement has been put to the greatest test, never failing to save fifty per cent. Apply to G. PEACOCK, West Troy, N. Y. 22 3*

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LAWRENCE SCIENTIFIC SCHOOL—Harvard University. The next Term of this Institution will open on the second day of March, 1854, and continue 20 weeks. Instruction by Recitations, Lectures, and Practical Exercises, according to the nature of the study, will be given in Astronomy by Messrs. Bond, Botany by Prof. Gray, Chemistry, analytical and practical by Prof. Horsford, Comparative Anatomy and Physiology, by Prof. Wyman, Engineering by Prof. Eustis, Mathematics by Prof. Pierce, Mineralogy by Prof. Cooke, Physics by Prof. Lovering, Zoology and Geology by Prof. Agassiz. For further information concerning the School application may be made to Prof. E. N. HORSFORD, Dean of the Faculty, Cambridge, Mass. 21 4*

WANTED—A good permanent situation, either to run a stationary engine or take charge of machinery, where capability and a faithful discharge of duty would meet with a liberal recompense, by a person who is and has been for several years past, running a locomotive on one of the railroads out of New York. Good references given. Address J. C. GORDON, 438 Fourth Avenue. (On parle Francais.) 21 4*

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21tf Bridgeport, Ct.

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WEIGHING AND PACKING MACHINE—This machine is particularly adapted for the weighing and packing of ground spices, coffee, teas, saleratus, cream tartar, British luster, arrowroot, drugs, prepared flour, farina, starch, cocoa, oat meal, yeast powders, seeds, snuff, ground herbs, or any like material, which may require to be put in packages, from ounces to pounds. Its advantages over the old method of packing by hand, are manifest. One of these machines will, with the aid of one person, weigh accurately, and pack neatly, from 4 to 5,000 packages per day. It requires very little power to run it, and is not liable to get out of repair. Having purchased the exclusive right to manufacture and sell throughout the United States, we are prepared to execute orders for the machines or sale of sectional rights, on reasonable terms. N. B. HARRIS & Co., Proprietors of the Excelsior Steam Spice Mills, Philadelphia, Pa. 12 13

AMERICAN RAILROAD JOURNAL—This Journal, the oldest in the world devoted to the Railroad interest, will hereafter contain, in addition to its usual contents, a full and comprehensive department of Railway and Mechanical Engineering, prepared under the direction of a practical engineer and mechanic.—Improvements in Railways, Railway Equipments, and especially in Locomotives, will be duly described and illustrated. Inventors and improvers will find the Journal the best advertising medium, as it is taken by nearly all Railroad Companies and Engineers in the country. Published every Saturday at No. 9 Spruce st, by JOHN H. SCHULTZ & CO., at $5 a year in advance. 23 5*

PORTABLE STEAM ENGINES—GEORGE VAIL & CO., Speedwell Iron Works, Morristown, N. J., LOGAN VAIL & CO, No. 9 Gold st, N. Y., are prepared to furnish Portable Steam Engines from four to eight horse power, with locomotive boilers. These engines are recommended for their simplicity, durability, and economy, being made from the best materials and designed for practical use. They are placed on wheels convenient to be moved from place to place, and are shipped in working order: for plantation use, machinists, or others wanting small power, these engines will be found superior to any others in use. A Silver Medal was awarded at the late Fair of the American Institute, and a premium in cash of $100 at the Maryland State Fair, held at Baltimore in October last. Persons writing us by mail will be particular to give their address in full. 21tf

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1854—MICHIGAN CENTRAL R.R. LINE—D. W. WHITING, Freight Agent for R.R. and the enormous new steamers "Plymouth" and "Western World," and also General Forwarder, will forward freight of any kind, by any mode of conveyance, to any destination, with dispatch and at the lowest rates; has trucks and machinery (having been a practical machinist has all the skill necessary) for the safe and expeditious handling of any machine or heavy article, such as Locomotives, Steam Engines and Boilers, Engine Lathes, Church Bells, Safes, &c. Mark packages care "D. W. Whiting, Buffalo;" goods thus consigned take precedence with the above boats in all cases. 19tf

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JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe; they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post-paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 19tf

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CHARLES W. COPELAND,
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PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of feet Spruce flooring in ten months.. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y
1 tf GEO. W. BEARDSLEE.

MINING MACHINERY—Of most approved construction, furnished by FRED'K COOK & CO, Hudson Machine Works, Hudson, N. Y. 15 6m

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A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American. 16tf

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McALLISTER & BROTHER.—Opticians and dealers in mathematical and optical instruments, No. 48 Chesnut st., Philadelphia, Pa.—at the old stand established in 1796 by John McAllister, Senr, Mathematical instruments separate and in cases, Tape Measures, Spectacles, Spy Glasses, Microscopes, Thermometers, Salometers, Hydrometers, Magic Lanterns, &c., &c. Our illustrated and priced catalogue are furnished on application, and will be sent by mail free of charge. 10tf

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41 1y.* THOMAS, CORSON & WEST.

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Scientific Museum.

Concentrated Human Labor.

In late accounts from Europe, we have seen it stated, that R. Stephenson, the eminent engineer is now in Egypt for the purpose of reconstructing a new railroad there, which during his absence in Canada, had been laid down upon an embankment which proved altogether too low for the inundations of the Nile. The following is a very pithy description from one of Mr. Stephenson's speeches showing what can be done by concentrated labor:—

In connection with the Britannia Tubular Bridge, there were nearly two millions of cubic feet of masonry required; in three years the two millions of cubic feet of masonry were brought from the quarry and put together, and raised into a magnificent edifice. Three cubic feet of masonry were set every minute for twelve hours in each day, for three hundred days in a year, and for a continuous period of three years. He mentioned the circumstances in regard to the time in which so much work was performed by ingenuity in the application and use of tackle; but they must not overlook the fact that other things are brought to bear in other countries which nearly rival any thing that we can do as regards the amount of work done. A case of this kind came under his notice in Egypt; an embankment was to be constructed over the Delta of the Nile, extending over one hundred and forty miles, and in eighteen months the embankment, eight feet high, and twenty-five feet wide, was constructed, an operation which struck him as remarkable for the systematic application of human labor properly divided. This was done, too, in what was called a barbarous country; but he has never seen it excelled in any country, however civilized.

Effects of Luxury.

Luxurious habits will not, of course, engender crimes of turbulence or violence; will not become the parents of the rougher and fiercer vices; but, not the less, they may demoralize a man to his heart's core. They have an enervating and enfeebling influence; nay, it is an indisputable truth, though it may sound like a paradox, that, in aggravating his selfishness, they soften and harden a man at the same time. They soften him, as they render him more and more unable to endure privations or cope with difficulties, and as they bind him round with the roseate chains of self-indulgence; they harden him as they accustom him to live in a state of callous apathy with respect to the necessities and distresses of his fellow-creatures, and as they turn his face like a flint, against any appeal which may disturb his repose or offend his fastidiousness, which may give him trouble or demand of him effort and exertion; they make him a sickly Sybarite, neither resolute nor gentle; without vigor, and yet without tenderness.

The Source of the Arveiron.

I was advancing close to the glacier, to observe the source of the Arveiron, when the guide, David Coutet, came and earnestly called me back; he then pointed out a source of danger which I had not before observed. High upon the edge of the glacier lay numerous stones and rocks, some of them of large size, which might at any moment fall, with imminent danger to those below. I of course withdrew to a place of safety, where I could at my ease view the birth of the river. Above is an elegant crystal arch, which, when we saw it, was about twenty feet high; but in August this vault will be thirty or forty feet or more above the stream. It can then be entered, but not without serious danger, as the long and huge icicles and other masses frequently fall. Some years since, two young Englishmen who had entered the cavern, had the extreme temerity to fire a pistol there. The concussion, as might have been expected, brought down so much ice that one of them was killed, and the other severely wounded. The Arveiron, even at its exit from under the glacier, is a large and vigorous stream, turbid with the pulverised granite from the bed of the glacier. It rushes onward with great power.—[Silliman's Visit to Europe.

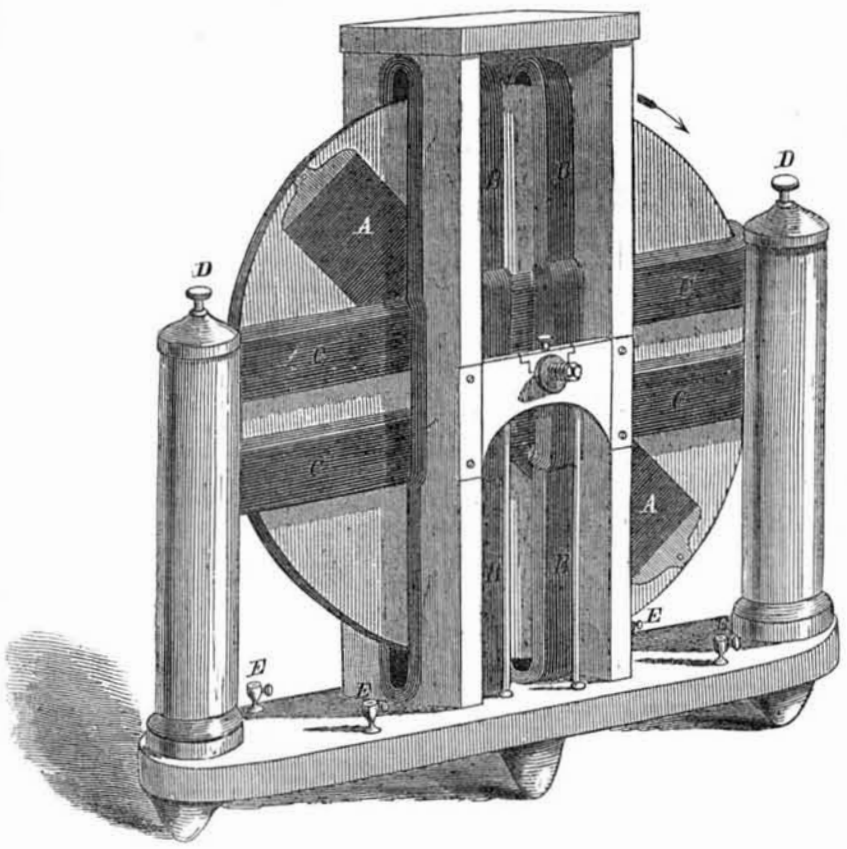
[Captnre of a Sea Serpent.

The John O'Groat (Scotch) Journal gives a long descriptive account of a curious marine animal recently captured on the Caithness coast. It was of the species Gymnotrus Hawkenii, and is described as a creature of a snake-like form, sixteen feet in length covered with a long pendulous crest on the back of the head.

The ship Great Republic has been abandoned to the underwriters. It is uncertain what will be done with her. Capt. McKay has collected the insurance on her to the amount of $235,000.

Twenty locomotives for different Western roads have been detained at Erie.

VERGNES' ELECTRO-MAGNETIC ENGINE.



This machine is, in a measure, founded upon the same principle as a huge galvanometer, which instrument consists of a magnetic needle, suspended by its center of gravity within a lateral multiplying circuit. The slightest current of electricity effects the needle, by tending to place it at right angles to the coil. As this is the most sensitive of all instruments, should it not also be the most powerful? One difficulty in the way of using such a machine would arise from the fact, that after several revolutions, the current of the lateral coil, which runs in a contrary direction to the polarity of the magnet, would destroy its energy. On the other hand if an electric magnet is employed, and the current of the battery runs through the coil as well as the wire that excites the magnet, the effect is but feeble. In the machine of which the above is an engraving, Prof. Vergnes supposes he has avoided these two defects. A A, is the electro magnet enveloped by the wire to excite it, and forming the diameter of a wheel of wood. It revolves within the multiplying coils, B B, C C. These are two distinct coils; C C, C C, forming in fact but one, and B B, B B, the other, divided as they appear above, solely for the admission of the axle; they are alternately excited, so as to produce a rotary motion of the magnet A A, and the wheel. The great improvement in this machine is the employment of two distinct separate batteries, one communicating with the magnet, the other with the coils. By this, the magnet always retains its strength, and is not liable to be depolarized by the lateral current; in all positions its power remains the same. And the current of the lateral coils is always of equal volume. This machine, instead of being on the principle of the resistence of the passive current of the natural magnet, or of the current of one battery, upon itself, is on the principle of the resistance of two active currents of separate batteries, contending with each other. It follows of course, that by increasing the size of the machine and the strength of the current, the power must be at least proportionally increased, and Mr. Vergnes insists that it increases at a much greater ratio, than a direct proportion. The battery used by Mr. Vergnes requires neither platina nor nitric acid. He employs calcined coke placed in an earthen vase, surrounded by a cylinder of zinc, the whole immersed in a cylindrical vase of copper, and for acid, a mixture of peroxyd of manganese and sulphuric acids. By this arrangement the negative surface is extensive, and the zinc, although in limited quantities, radiates without losing a particle of its surface on the side of the coke. Mr. Vergnes calculates that in a machine of one horse power no more than sixty to sixty four cents worth of acid will be consumed daily.

Weighing Bodies by Submersion.

Messrs. Editors:—Reading in Dingler's "Polytechnic Journal" an article of which the following is a translation and extract, it struck me that, in connection with Mr. Griffith's article on the tunnage of ships, published in your valuable journal, it might be acceptable to your many thousand readers:—

"Professor Dove, author of a theory of storms, gives the following experiment as a beautiful and very demonstrative illustration of the hydrostatic law, that a floating body displaces as much water as it (the body) weighs. Fill a cylindrical glass vessel to a certain mark with water, and balance the filled glass on a pair of scales; empty the glass, put in a floating body, refill the glass to the same mark with water, the body floating in it, and the weight of the whole will not have changed. The floating body weighs evidently as much as the water, which formerly filled the place of its submerged part."

Dr. Fr. Mohr founded on this experiment a very easy method of ascertaining the specific gravity of solid bodies, which sink in water, by measurement. A. Zumbrock, M. D.

Philadelphia, Feb. 9, 1854.

Uses of the Beard.

There is in the crypt of Hythe Church, one of the Cinque Ports of England, a vast pile of human bones, which were gathered many years, after the battle fought on the sea shore, between the Danes and the Saxons, about 1000 years since, and amongst them are skulls of aged warriors, finely developed; the teeth in many of which are so perfect, so beautifully sound, and so firmly embedded in the sockets, that you cannot remove them. The owners of those teeth wore beards.—[Exchange.

[The author of the above, we can easily perceive has a hirsute lip and chin. Perhaps the teeth of the wives of those savage Danish and Saxon warriors, were just as good, as those of their Liege Lords.

The Iron Manufactures of the World.

The manufacture of iron in the world is divided as follows by the London Chronicle:—In Great Britian, 2,380,000 tons; United States, 400,000; France, 348,000; Russia, 189,000; Austria, 160,800; Sweeden, 132,500; Prussia, 112,000; making a total of 3,722,300 tons of iron manufactured annually. In 1850 there were 450 iron furnaces in Great Britain, and of the 2,380,000 tons which these produced, about 809,000 were exported. In 1796 but 125,000 were manufactured in Great Britain, and the total exports were about 408 tons. During the ten months ending November 5,1853, Great Britain exported $75,000,000 worth of Iron, and by far the largest portion of this enormous mass of exports was taken by the United States. Of pig iron the United States received 57,000 tons, and Holland, which comes next upon the list, took 13,000. Of bar, bolt and rod iron, the United States took 263,530 tons, or nearly six times as much as Canada, which received the next largest amount.

Portable Steam Engines for Planters.

The Charleston (S. C.) "Evening News" speaks very favorably of the portable steam engines manufactured in that city, by William Lebby. It says:—"The smallest size is three horse power, which, from its extreme lightness, may be drawn by a single horse, over roads upon a farm where it would be impracticable to take an engine of greater weight. The five horse engine may be drawn by two horses on a tolerably good road, and is chiefly used for thrashing. One of eight-horse power may be made available for many other purposes such as sawing, pumping, or for driving the whole of the barn implements of a plantation. On very large estates where more power may be required for driving mill-stones, sawing wood &c., a larger size can be furnished, but those already described are sufficient for all purposes to which they are likely to be adapted. The consumption of fuel varies, according to the power. The five horse engine consumes about a quarter of a cord of wood per day.

These engines are made of the best materials, and are very useful for planters."

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